



Apex Scientific

PRACTICAL & ATLAS OF HISTOLOGY

Part 1

By

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Copy Right
APEX Family

Histological sections for organelles and inclusions:

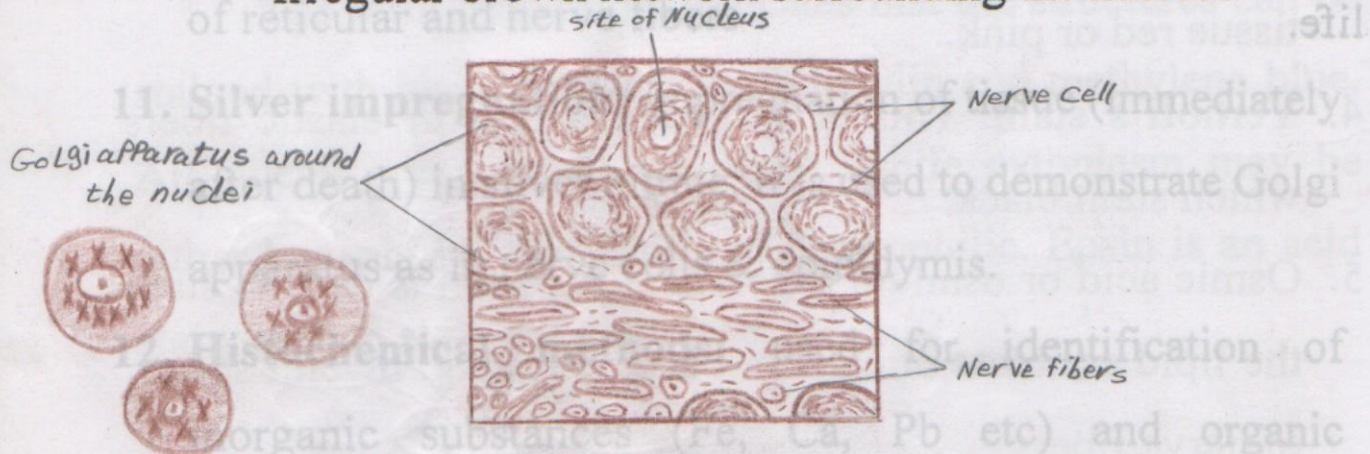
1- Golgi apparatus

- It concerned with the secretory activity of the cells.
- It can be demonstrated by a silver stain.

A- Golgi apparatus in nerve cell (Ag):

Notice:

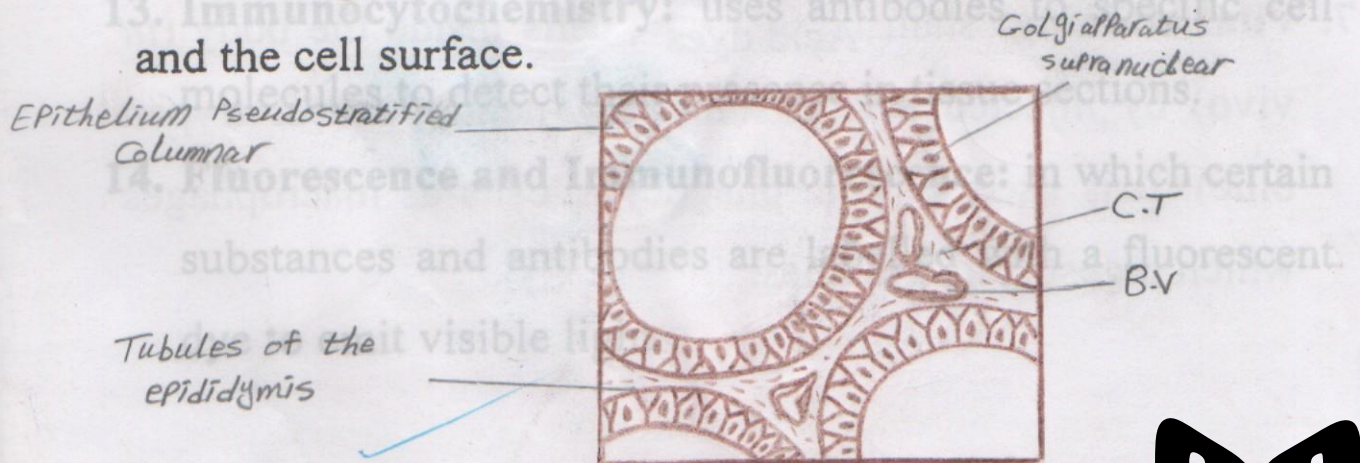
Irregular brown network surrounding the nucleus.



B- Golgi apparatus in epididymis (Ag):

Notice:

Irregular brown to black network between the nucleus and the cell surface.

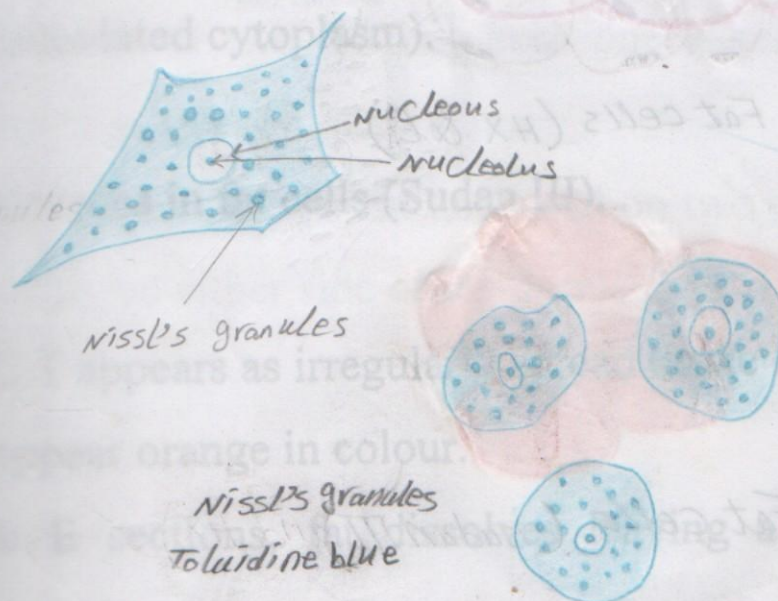


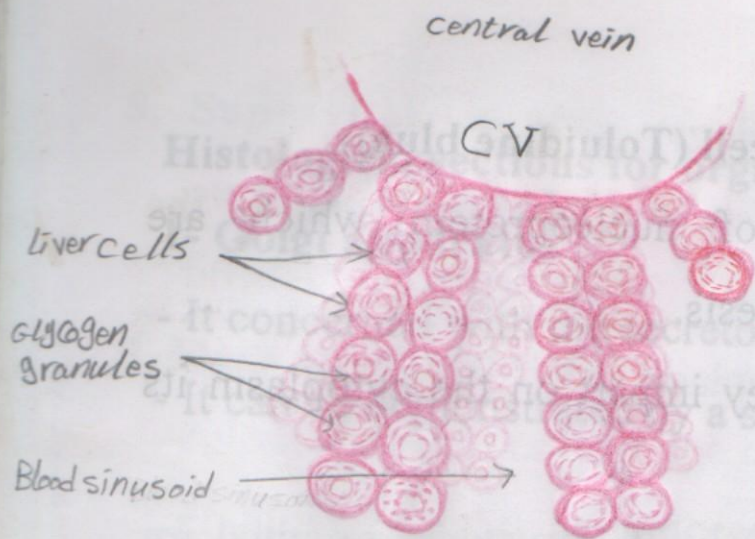
2- Nissl's Granules in nerve cell (Toluidine blue)

- Ribosomes are granules of nucleoprotein which are responsible for protein synthesis.
- Because they are acidic, they impart on the cytoplasm its basophilia which may be:
 - * Diffuse basophilia.
 - * Localized basophilia.
 - * Spotty basophilia → basophilic spots in the cytoplasm (Nissl's granules of nerve cells).

Notice:

Basophilic granules scattered in the cytoplasm.





Glycogen granules in liver cells (Best's armine)

glycogen granules



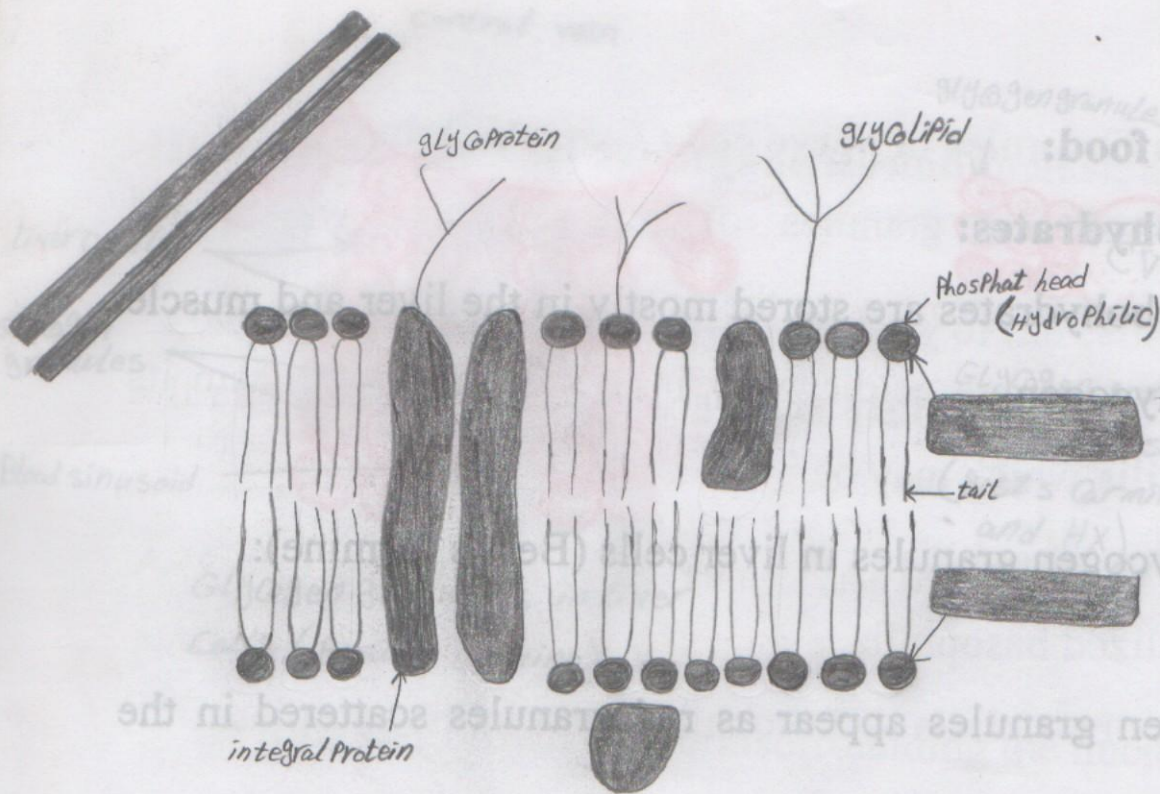
Glycogen granules in liver cells (Best's armine and HX)



Fat cells (HX & E)

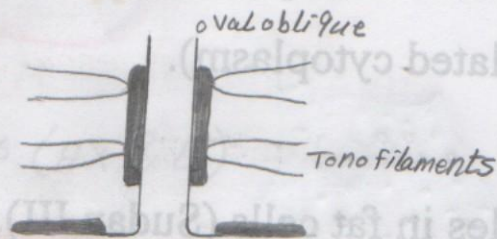


Fat cells (sudan III)



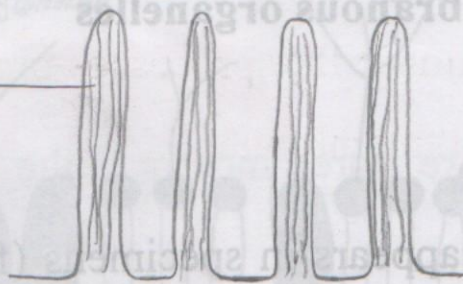
Molecular structure EM

Cell Membrane



Desmosome

Actin Filaments



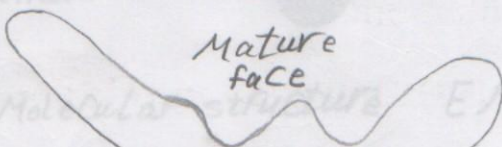
Microvilli

Cell membrane appears as a trilaminar structure (fixed in osmium for a long time) to be trilaminar or trilamellar, i.e. formed of three layers; an outer and inner dark lines separated by a middle light one. Such arrangement is called unit membrane.

GERL



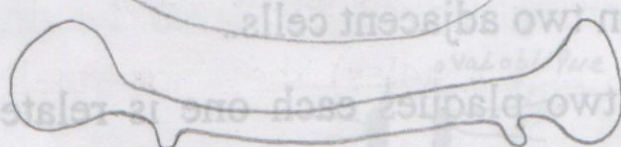
Mature face



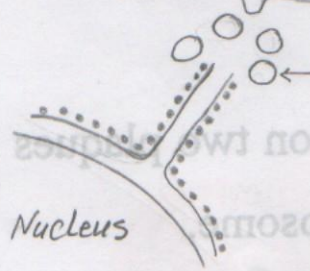
Flattened vesicle (FV)



Immature



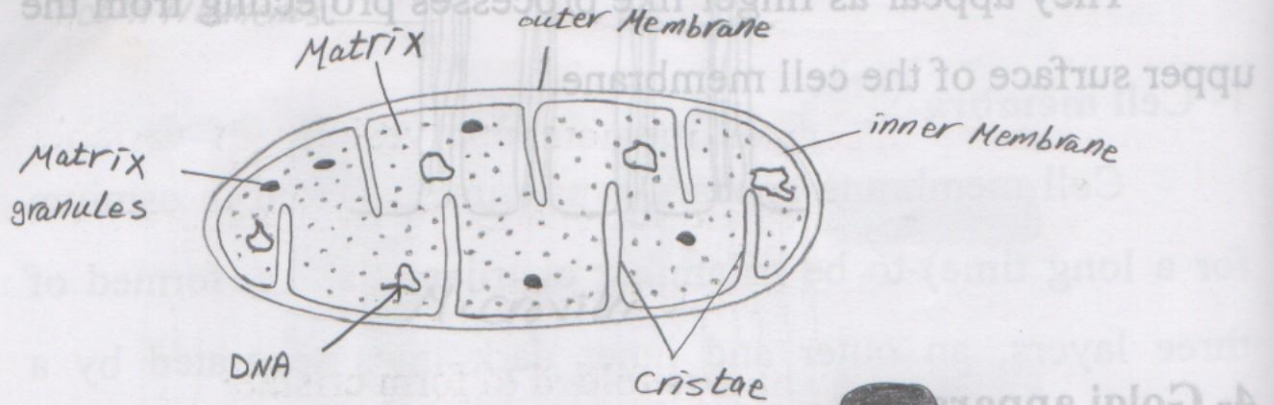
Microvesicles (MV)



Nucleus

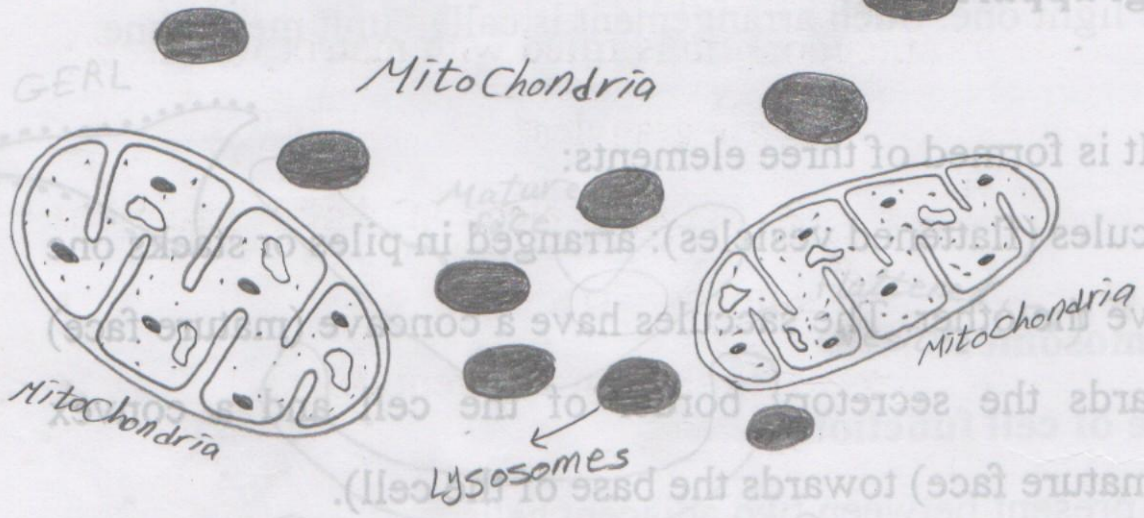
Golgi complex

They appear as finger like processes projecting from the



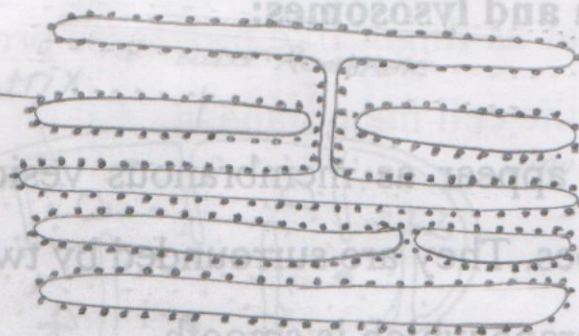
4-Golgi apparatus

Notice



Mitochondria and lysosomes

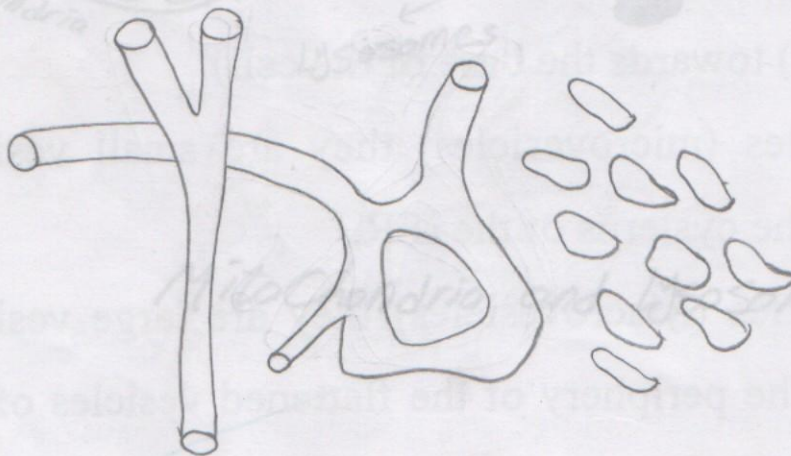
ribosomes



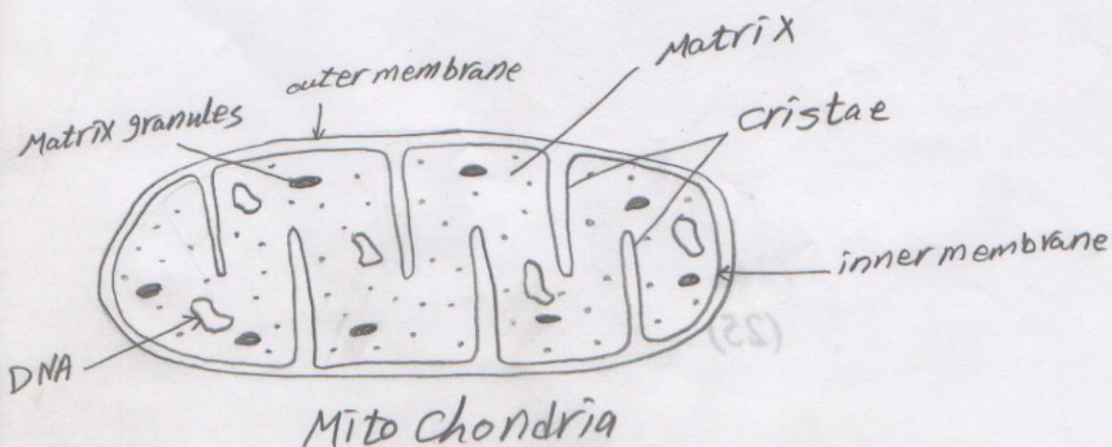
E/M RER

The cavity of mitochondria is filled with matrix which may show some electron dense granules.

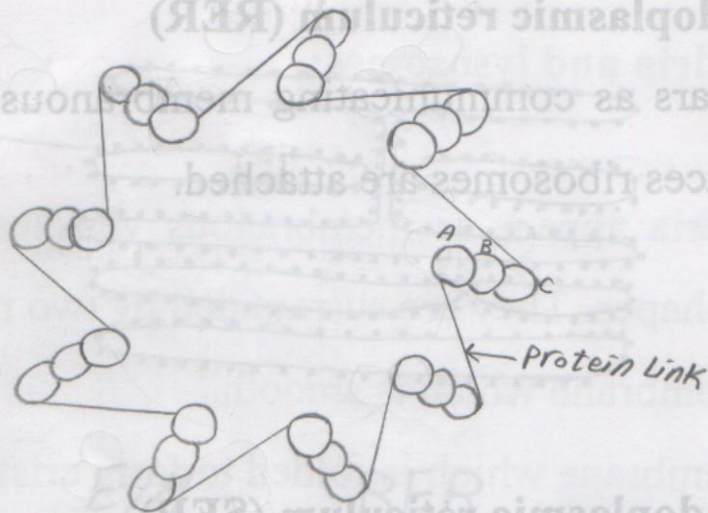
b) Lysosomes appear as rounded electron dense structures present between the mitochondria. They vary in number and sizes in different cells.



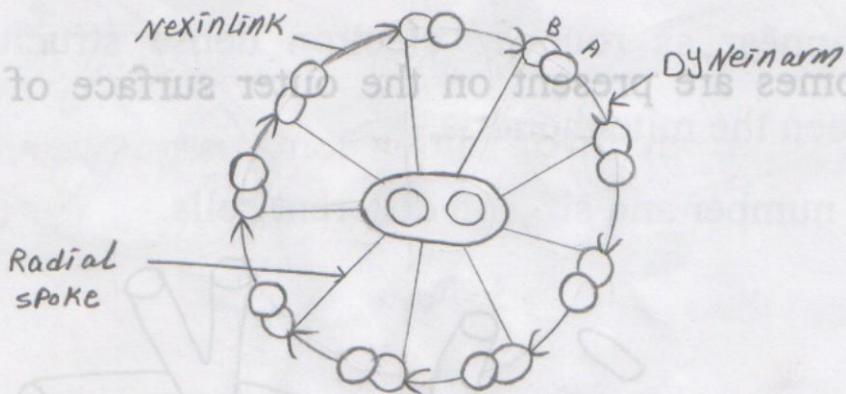
SER



Centriole



Nine Peripheral Triplet



Nine Peripheral doublets
with 2 central singlets

Microtubule

Microfilament



Microtubules
and
Microfilaments

Centriole

EM pictures of various organelles.

9-Centriole

T.S in a

microtubules arranged in nine bundles each consists of

three microtubules (triplets).

Protein Link



Glycogen granules

Nine Peripheral Triplet

10-Cilia

T.S in multiple cilia showing that the wall of each one is

composed of nine bundles, each bundle consists of two

microtubules (doublets) with

(singlets).

Nuclear Membrane

Nuclear Pore

ribosome

RER

Nuclear sap

Peripheral Chromatin

Nucleolus associated Chromatin

Island of Chromatin

Nucleolus

different direction in the cytoplasm of various cells.

Nucleus and Nucleolus

N.B.:

- In T.S they appear as tiny circles.

- They act as cytoskeleton of the cell.

Micro Filaments

flat nucleus

There are four basic tissue in the body. These are:

simple squamous epithelium

e.g. → Bowman's capsule

central rounded
nuclei



simple cubical epithelium

e.g. → Thyroid follicle

nonciliated

oval basal
nucleus



simple columnar epithelium

oval basal nucleus

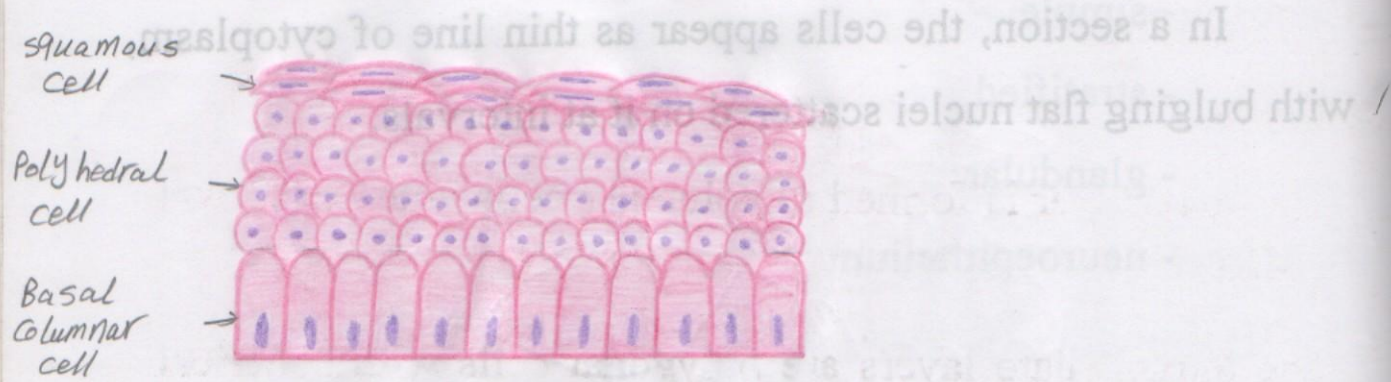


simple columnar epithelium

ciliated

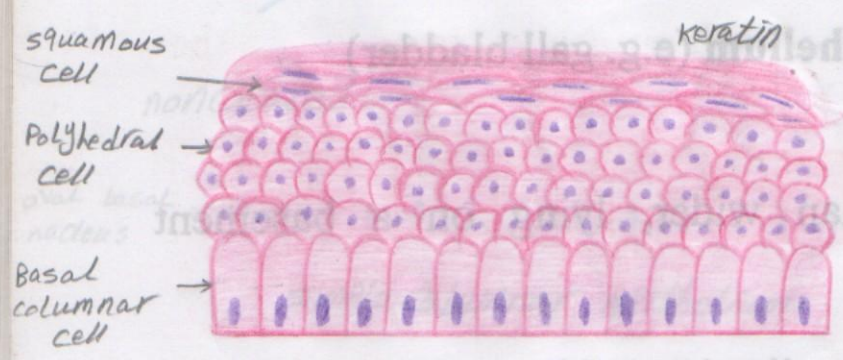
Epithelial tissue
I-Simple:

Simple squamous epithelium
I-Simple squamous epithelium (e.g. Bowman's capsule)

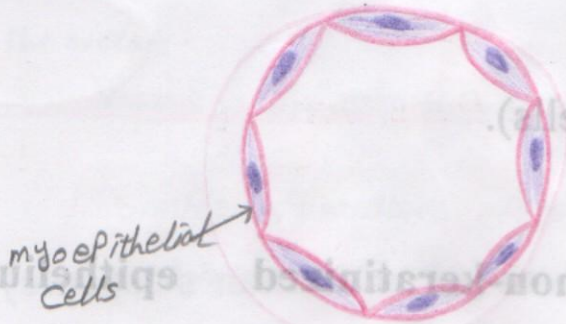


stratified squamous epithelium
Non-Keratinized

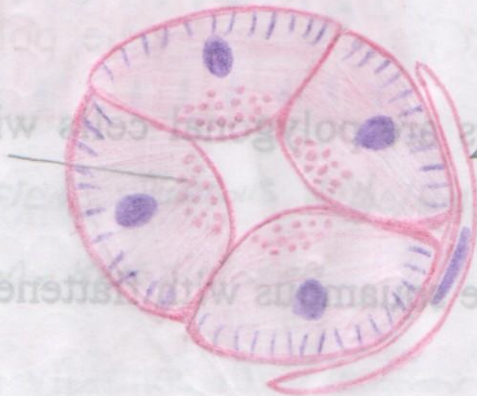
Notice: The cells appear cubical with centrally situated large spherical nuclei.



stratified squamous epithelium
Keratinized



Mucous acinus
(Glandular epithelium)



Glandular epithelium
(serous acinus)

III- Glandular epithelium

(Pancreas, mixed endocrine and exocrine gland).

Notice:

The exocrine part (exocrine acini) shows:

The acinus is lined with pyramidal cells with rounded

basal nuclei, basal striation and apical secretory granules.

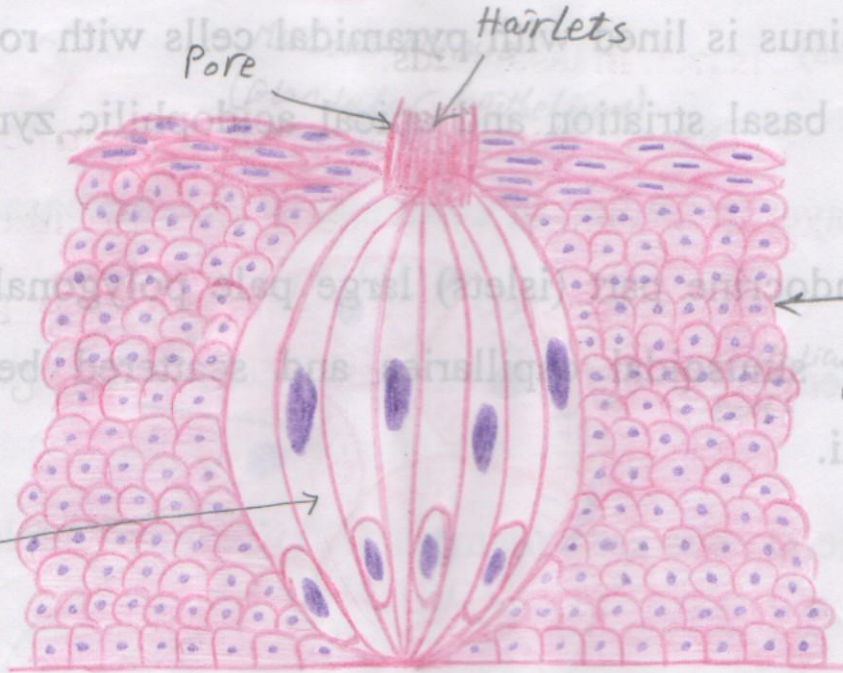
granules.

separated by connective tissue (large pyramidal cells)

between cells

exocrine acini.

The superficial



Neuro-epithelium

Taste Bud



Hx & E

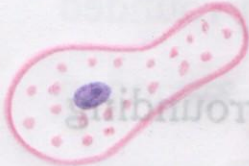


u-m-c



Sudan III

H&E



HistoCyte



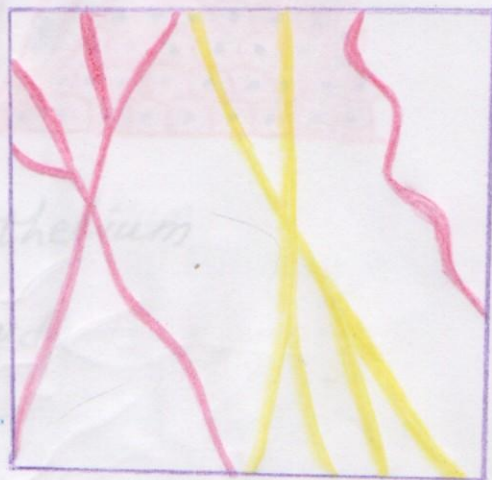
Fibro blast

wavy bundle

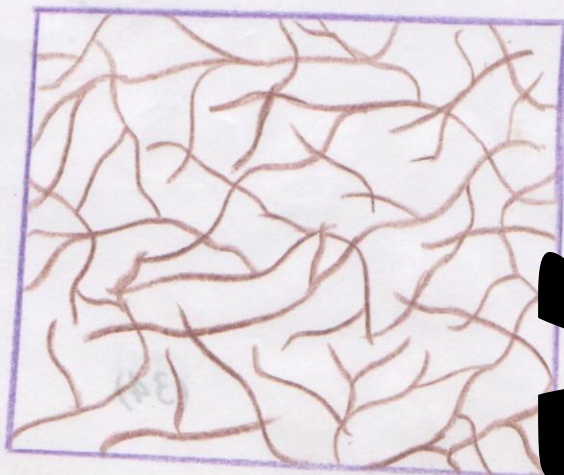


straightened bundle

white collagenous fibres
(H & E)

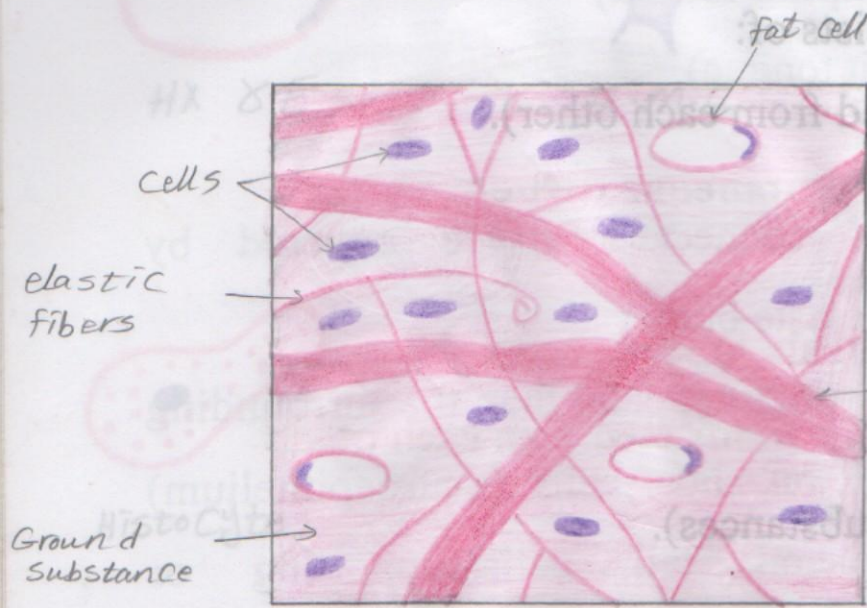


yellow elastic fibres
(H & E)



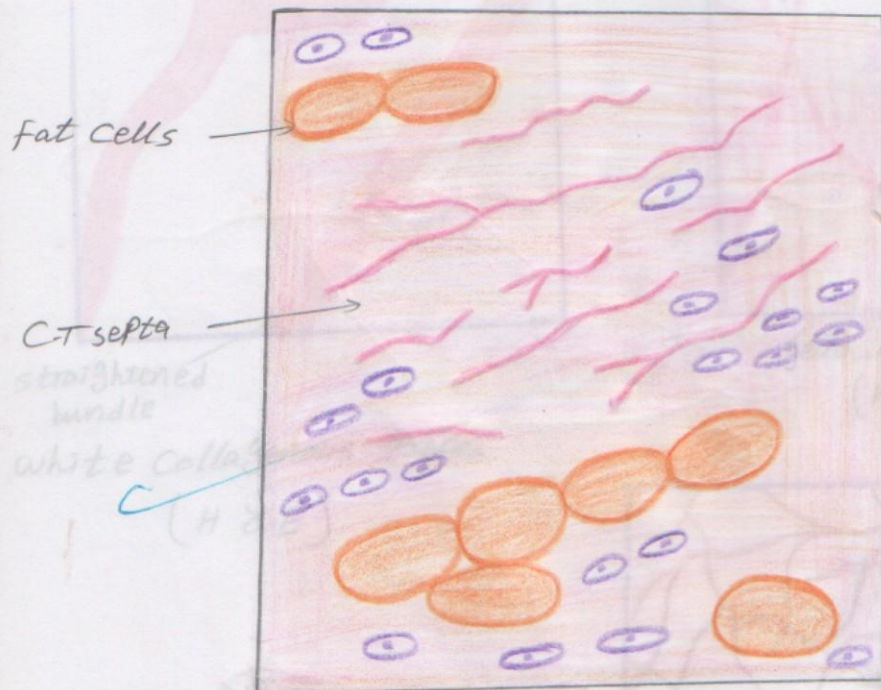
Reticular Fibres
(silver)

Connective Tissue (C.T.)



loose areolar C.T

wavy bundle

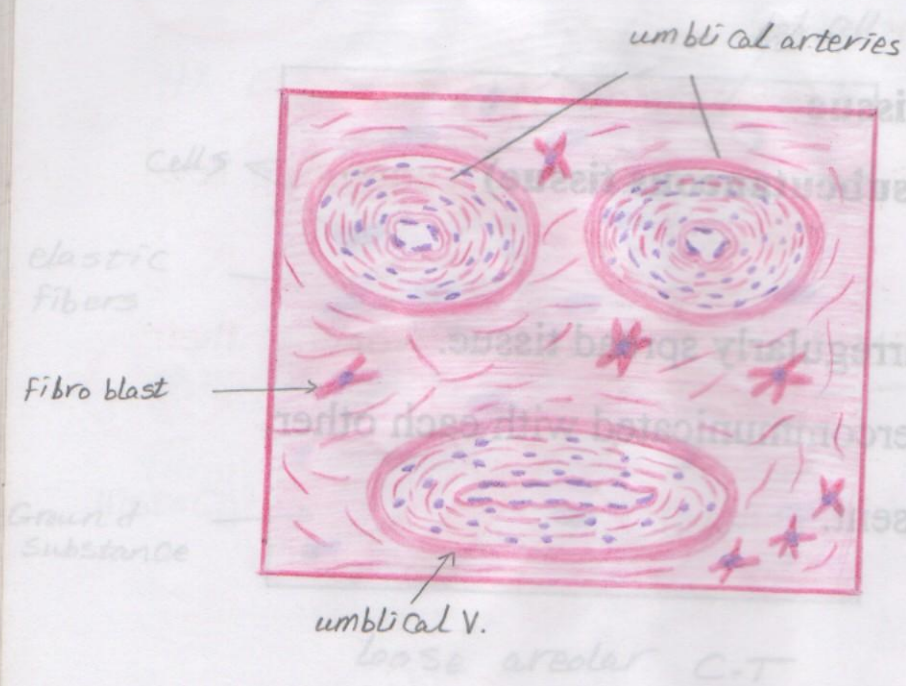


Reticular

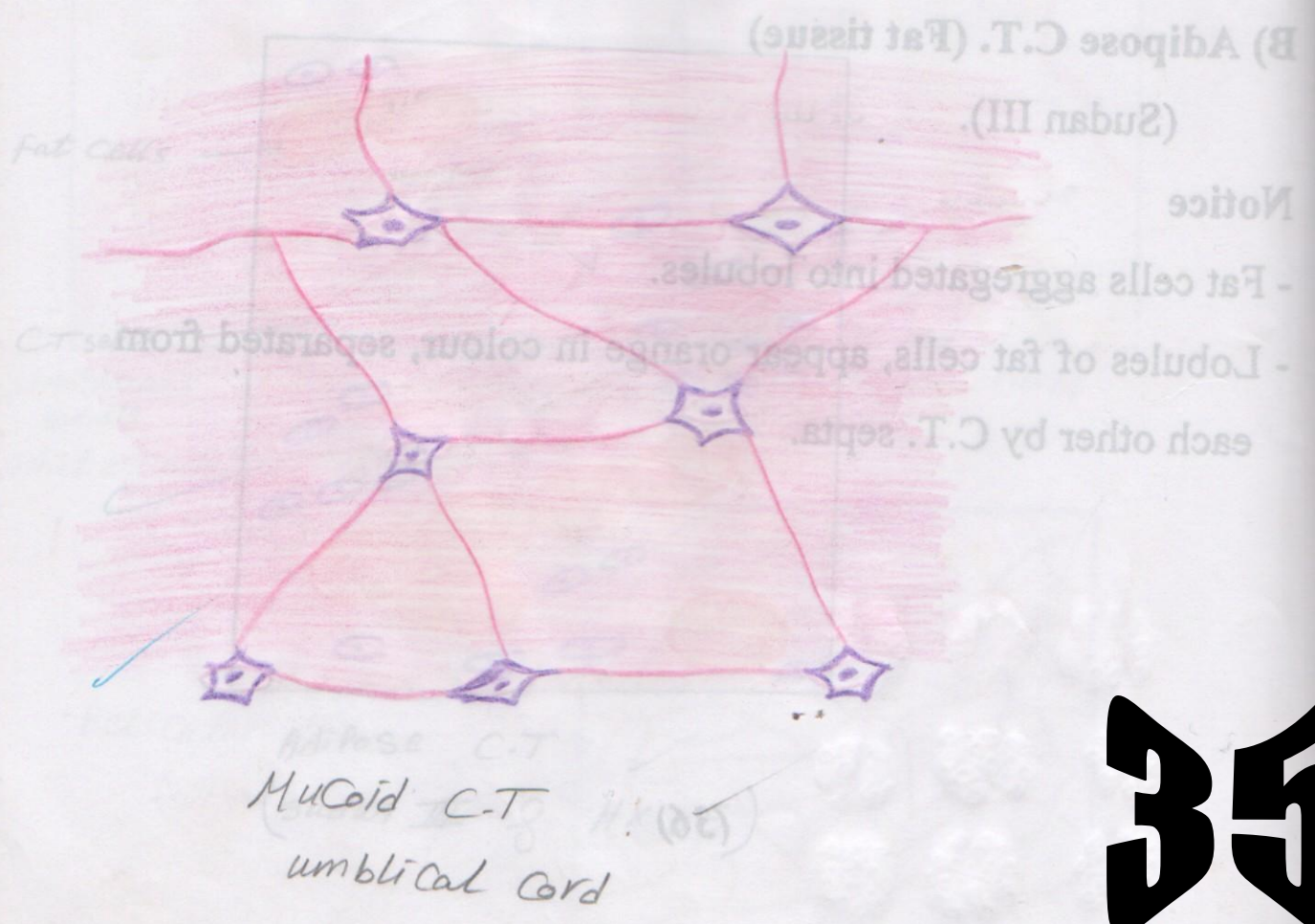
Adipose C.T

(sudan III & HX & E)

C.T. is classified into general and special C.T.



Mucoid C.T. (umbilical cord)



C) Muroid connective tissue (umbilical cord)

Notice:

- Two umbilical arteries and one umbilical vein.
- Matrix is abundant slightly basophilic and containing few fine collagen fibres.
- The cells are mainly fibroblasts forming a network by their processes.

D) Reticular connective tissue (silver stain)

(liver, spleen, lymph node)

Notice:

Reticular fibres of the stroma of the organ together with the reticular cells form a network (reticulum) which stain dark brown to black.



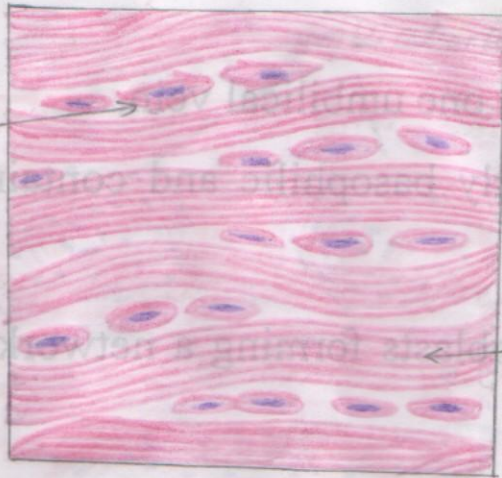
reticular C.T
(Liver)

Silver stain

C) Mucoïd connective tissue (umbilical cord)

Notice:

Fibroblast



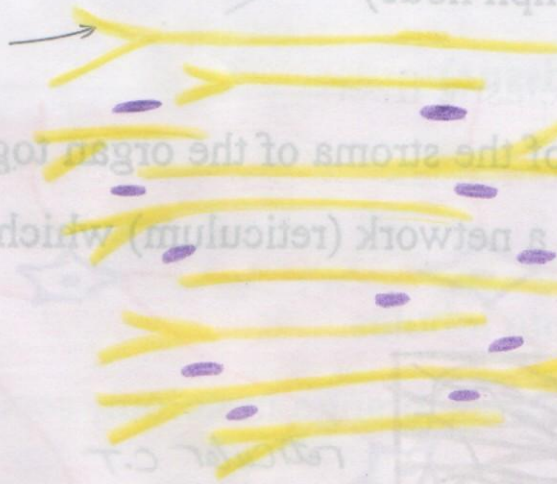
Collagen fibers

Dense regular C.T.
(Tendon)

D) Reticular connective tissue (silver stain)

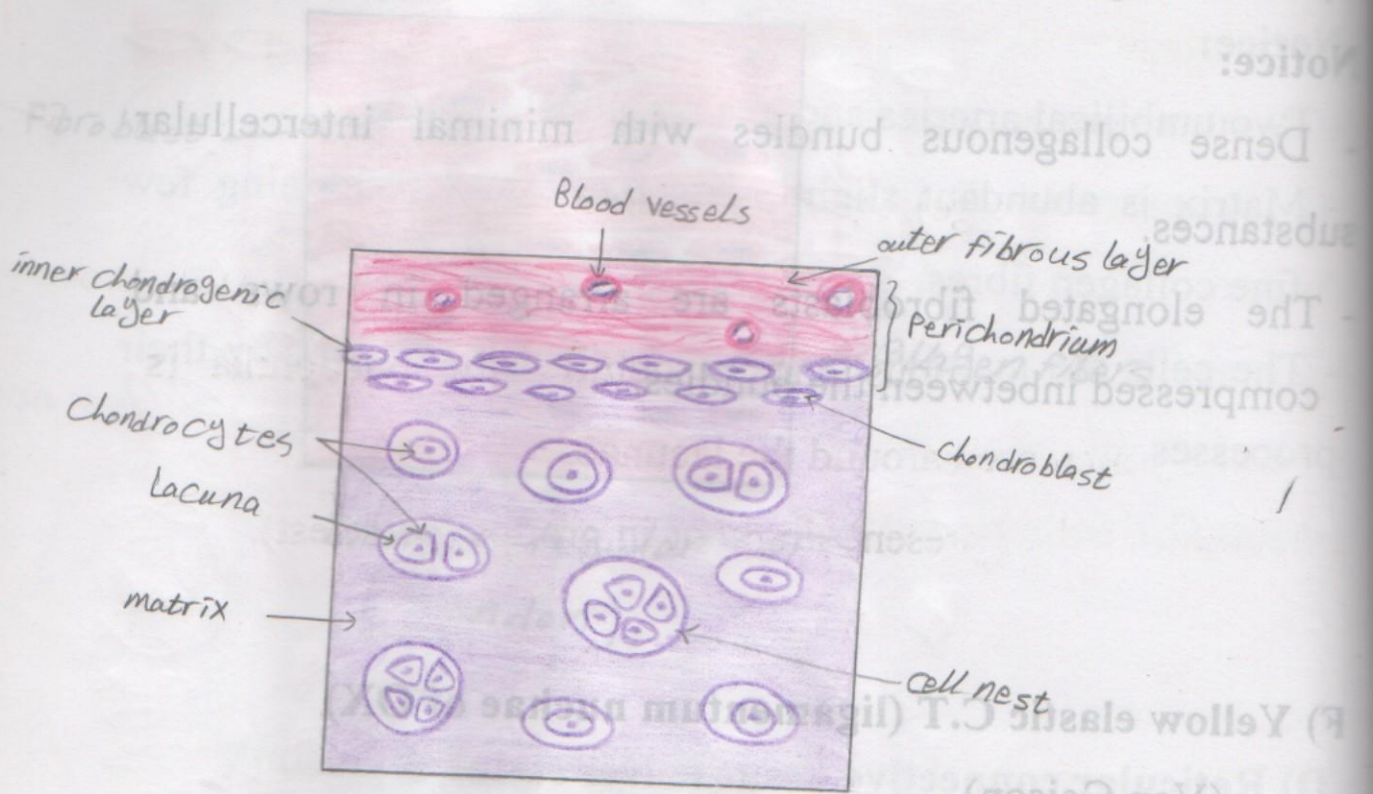
(liver, spleen, lymph node)

elastic fibers

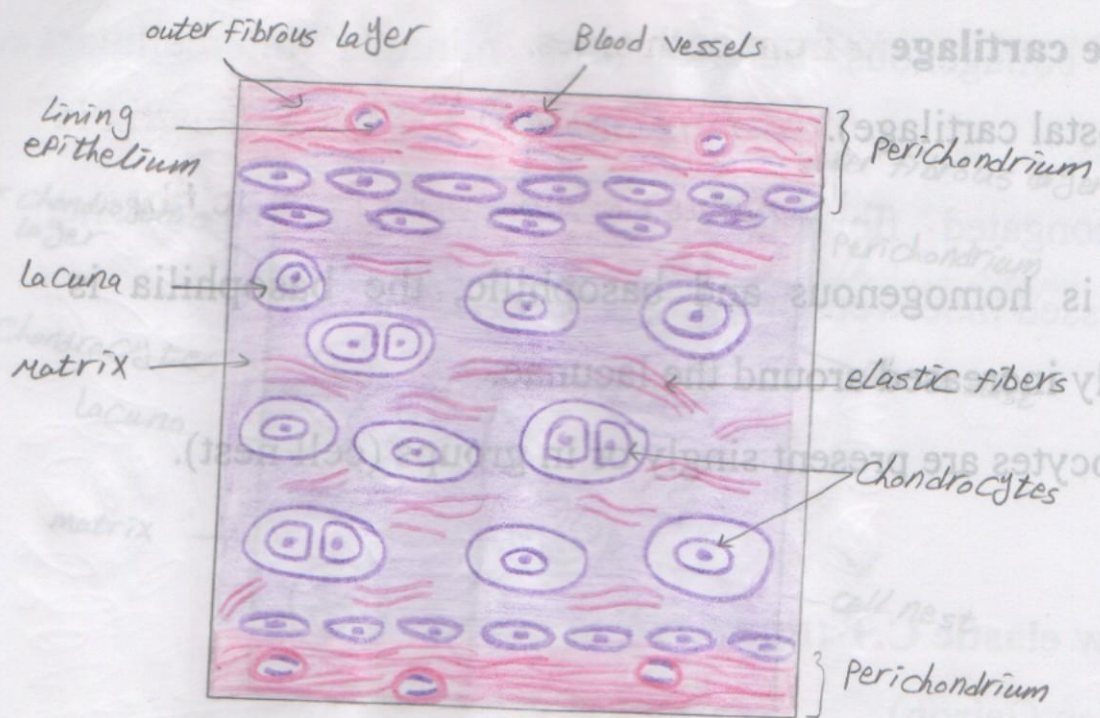


Yellow elastic C.T.
Van Gieson's stain
(ligamentum nuchae)

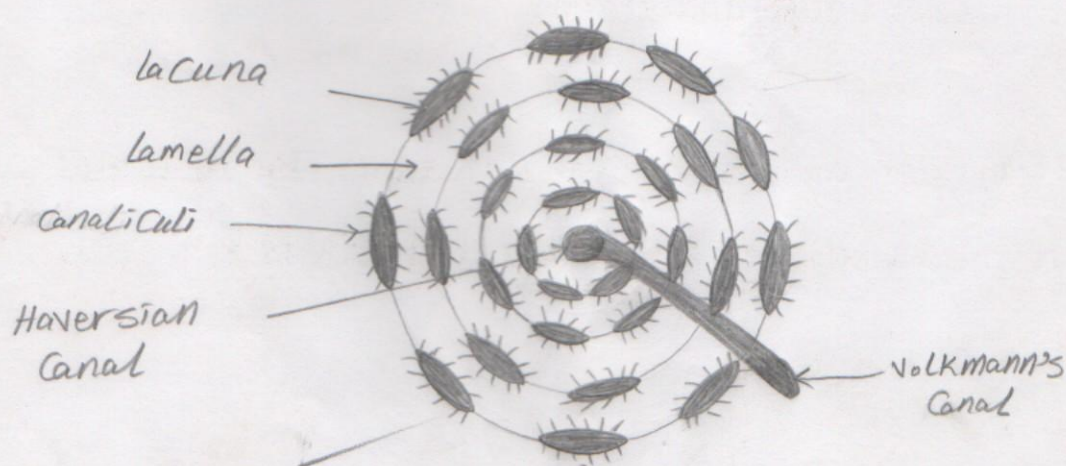
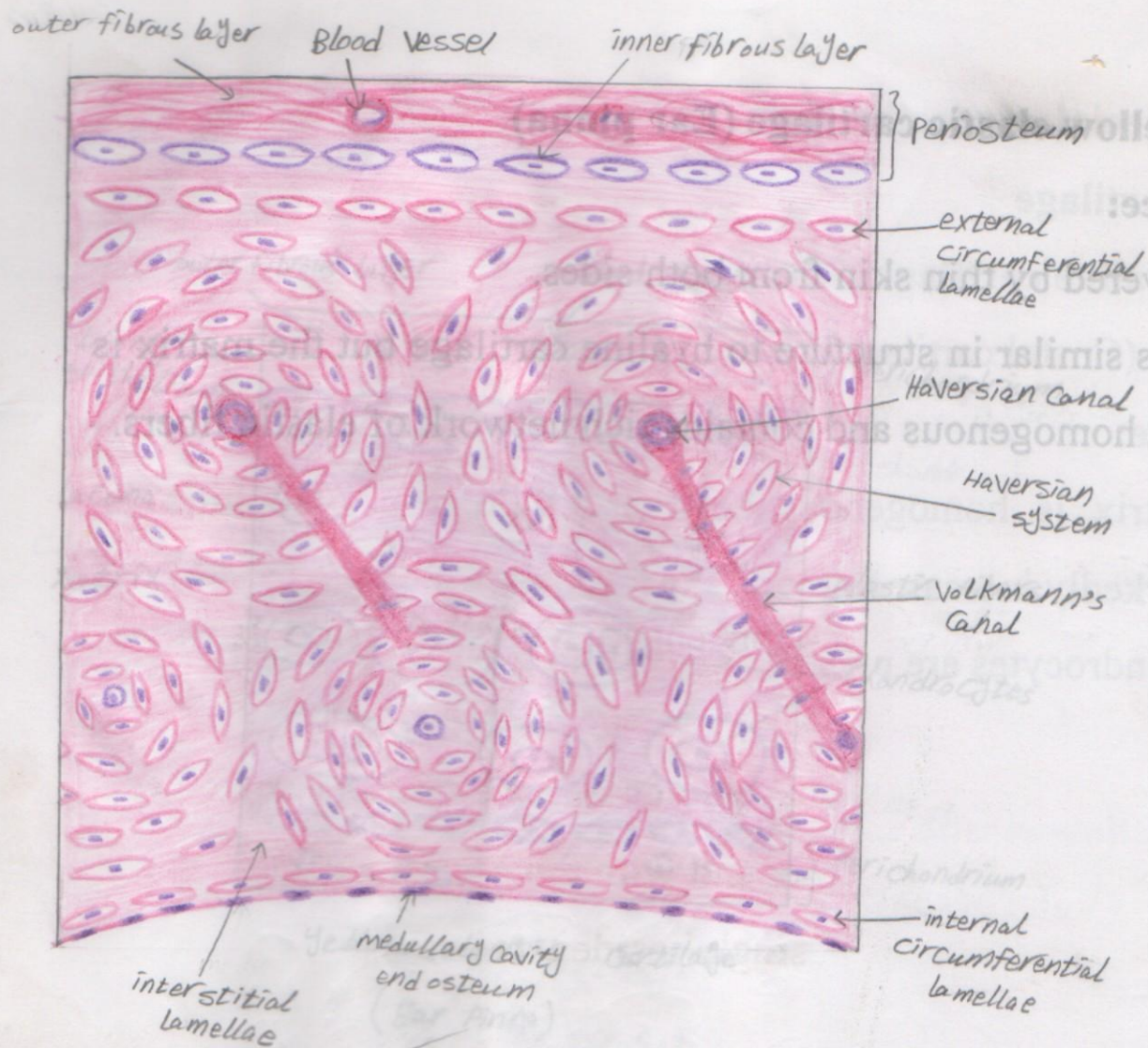




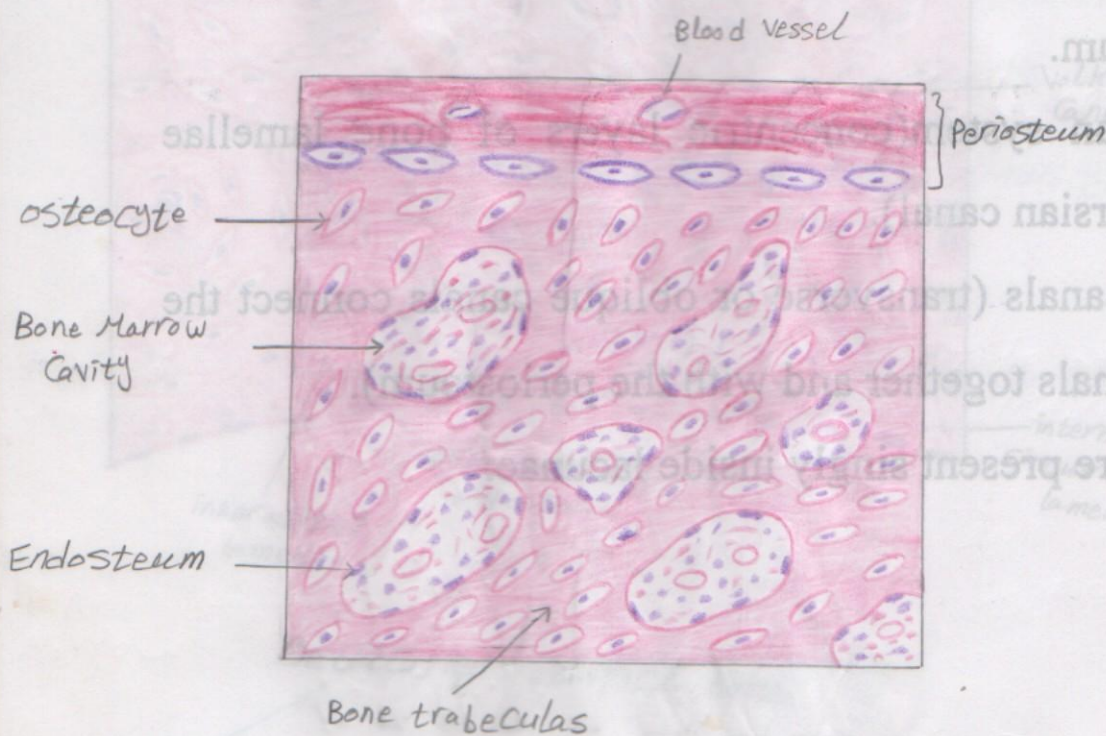
Hyaline cartilage
(costal cartilage)



Yellow elastic cartilage
(Ear Pinna)



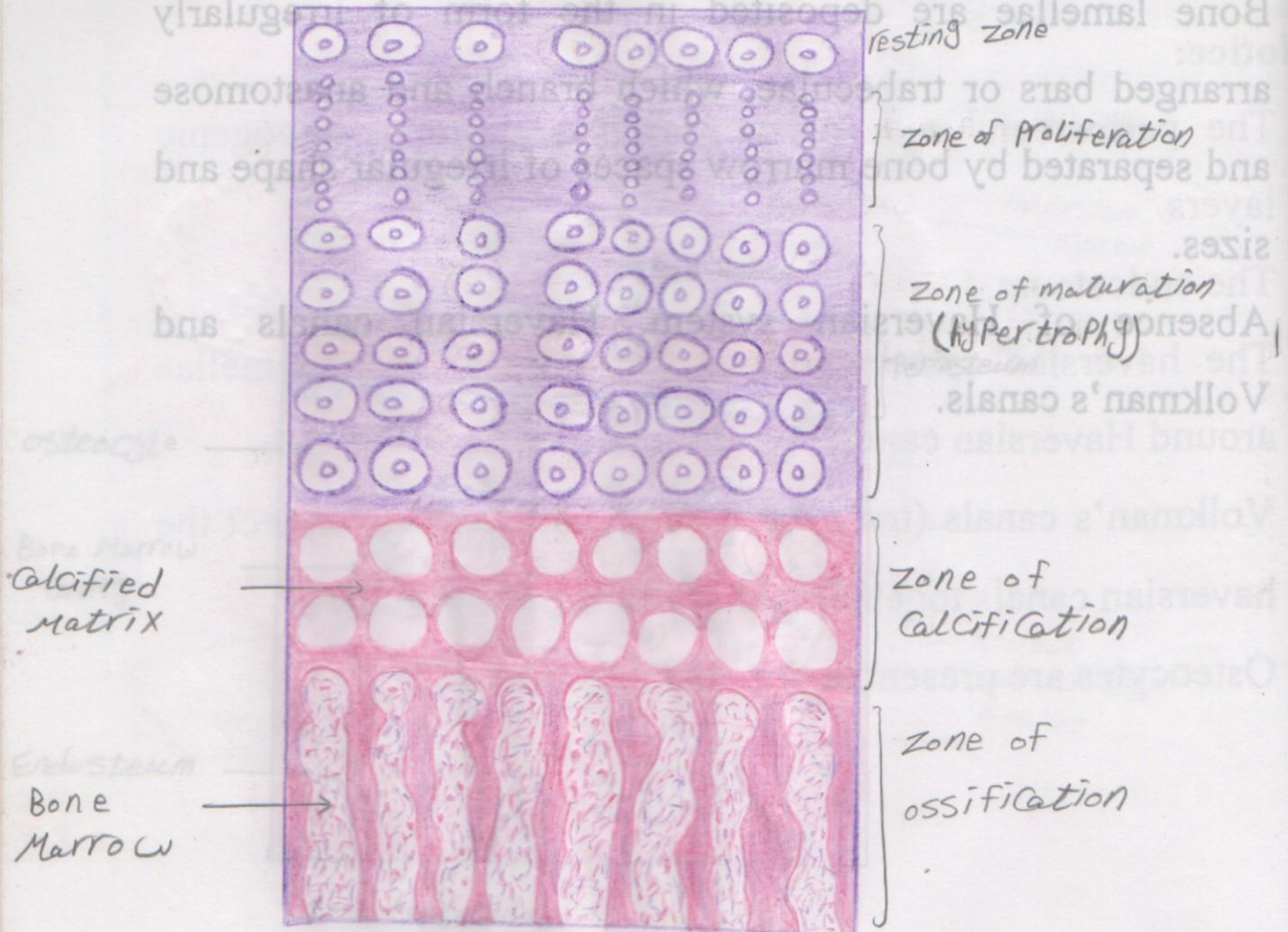
Ground Compact bone
un stain



Cancellous (spongy) bone

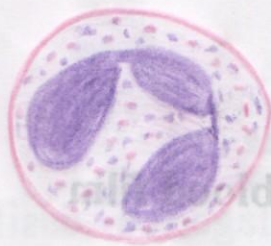
3- Spongy bone (cancellous bone)

Notice:





RBCs



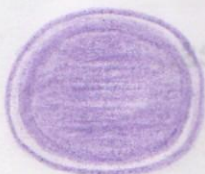
Neutrophil



Eosinophil



Basophil



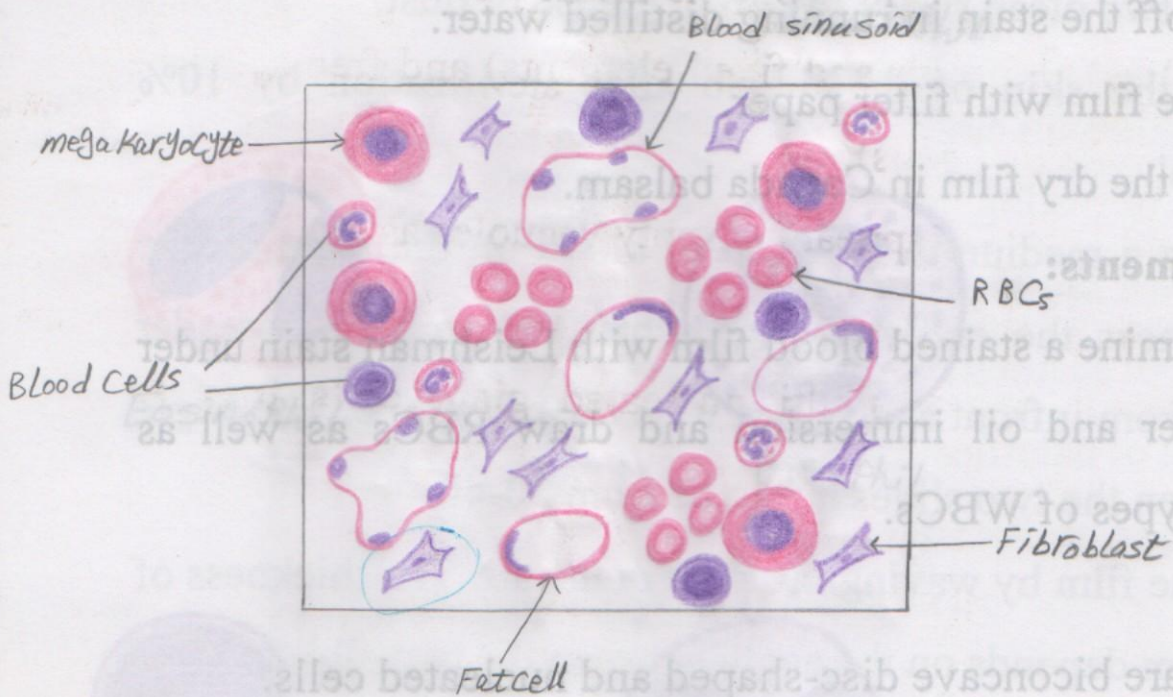
small Lymphocyte



Large Lymphocyte



monocyte

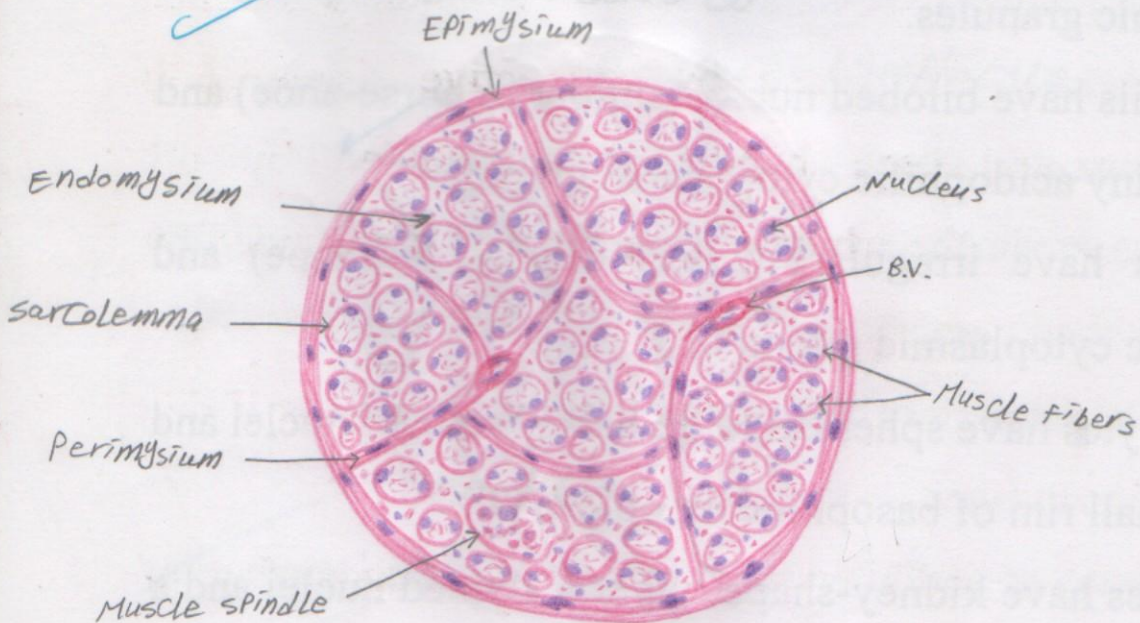


Bone Marrow

Bone Marrow

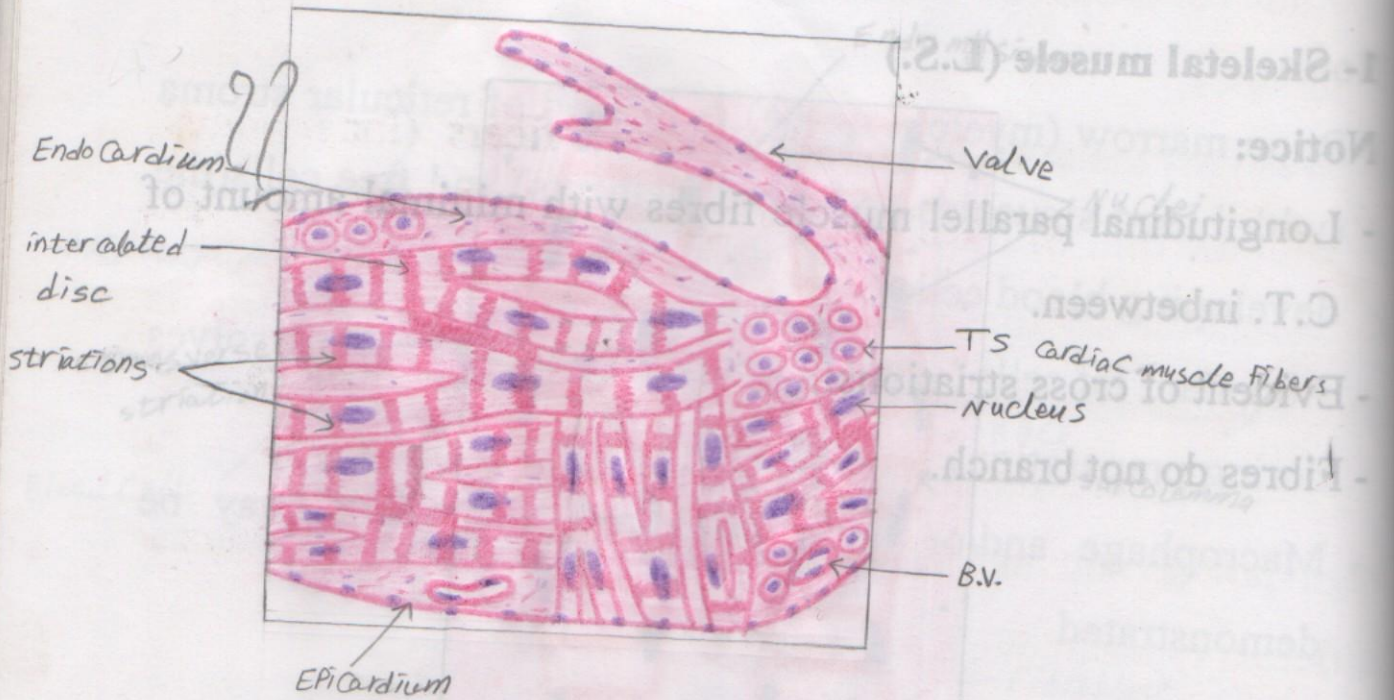


skeletal Muscle (L.S)

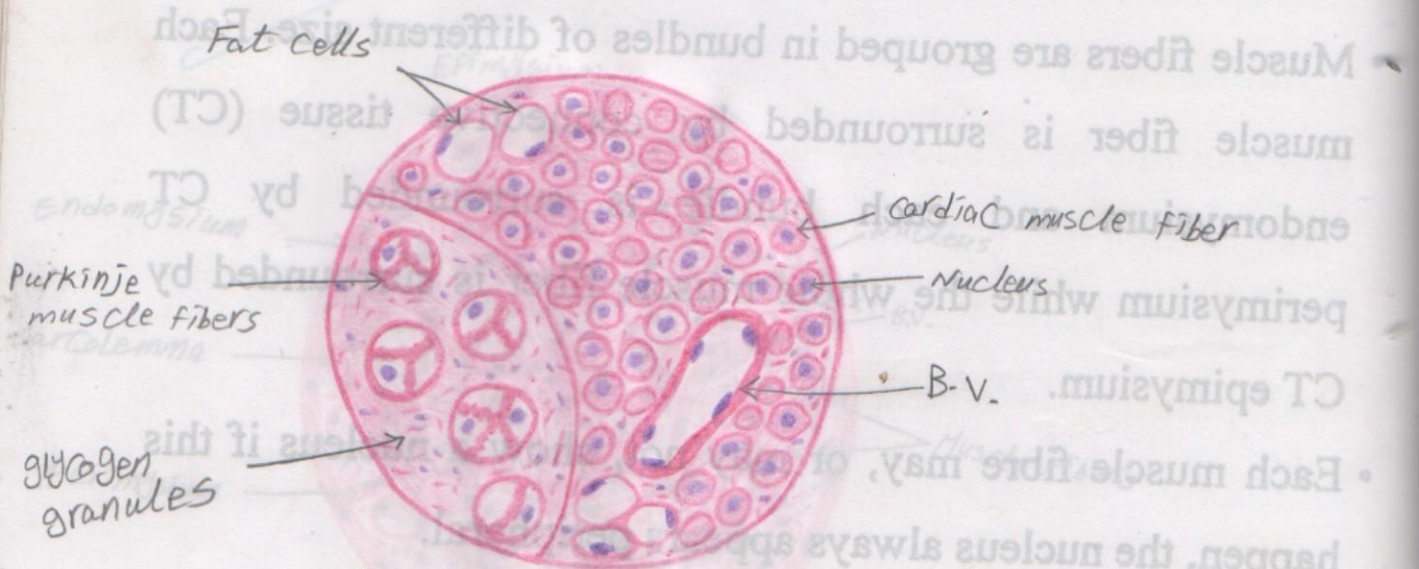


skeletal Muscle (T.S).

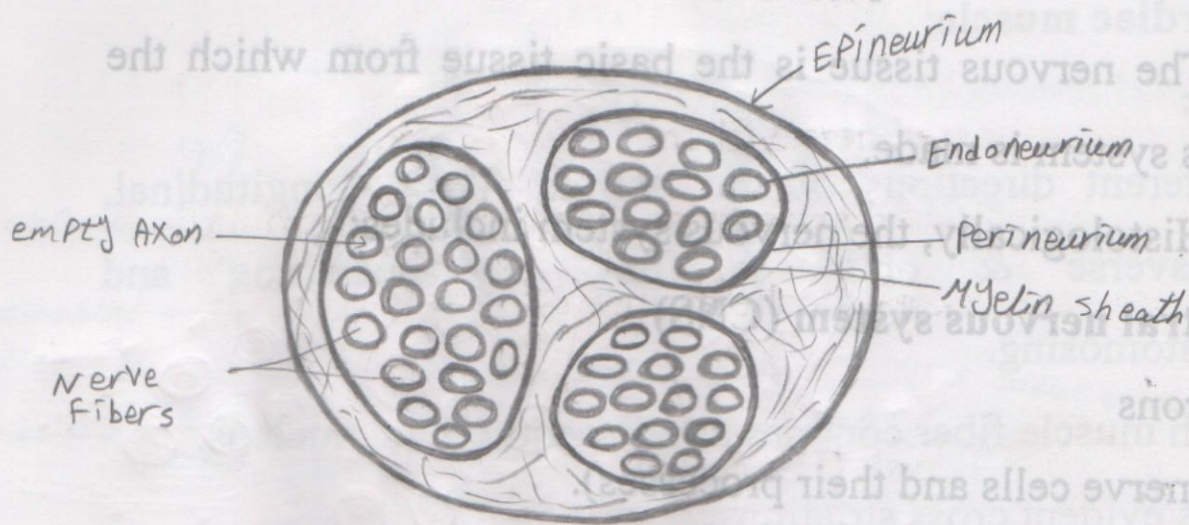
Muscular Tissue



Cardiac muscle and Valve

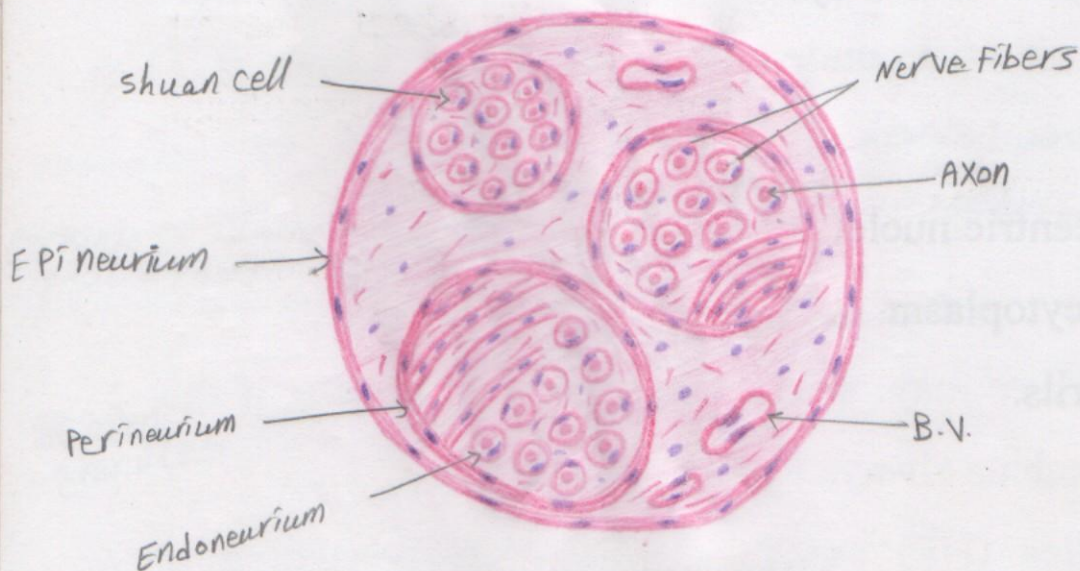


Moderator band

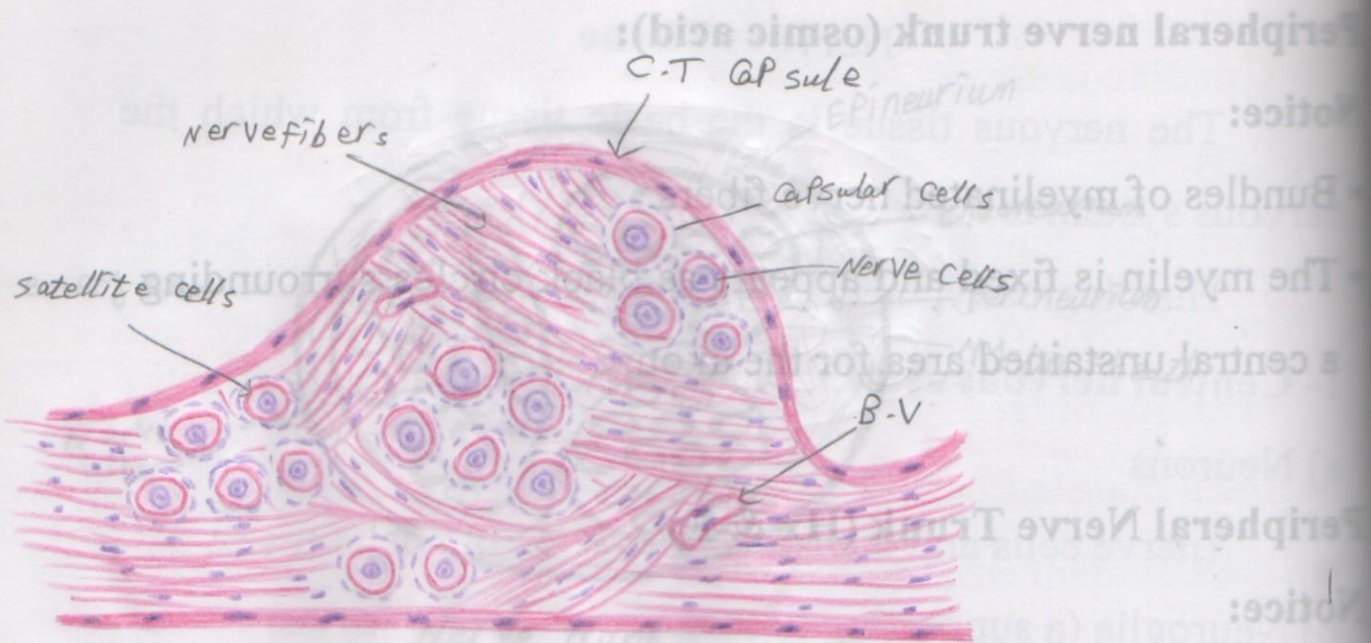


Nerve trunk

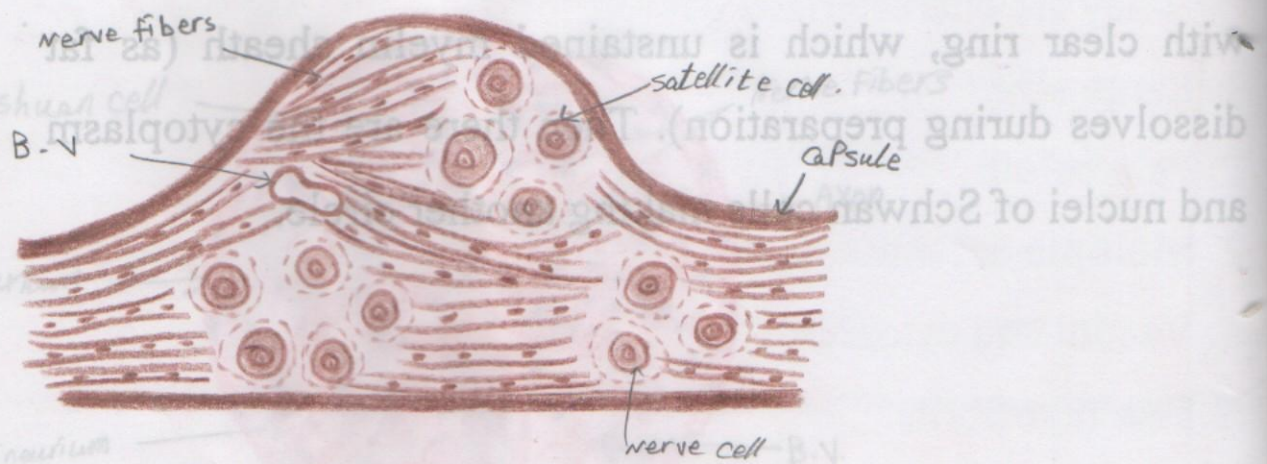
(osmic acid)



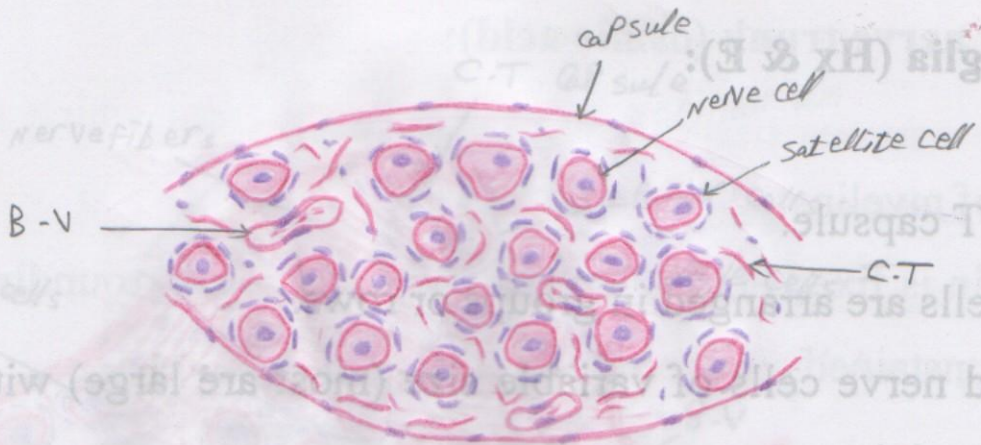
nerve trunk
(Hx & E)



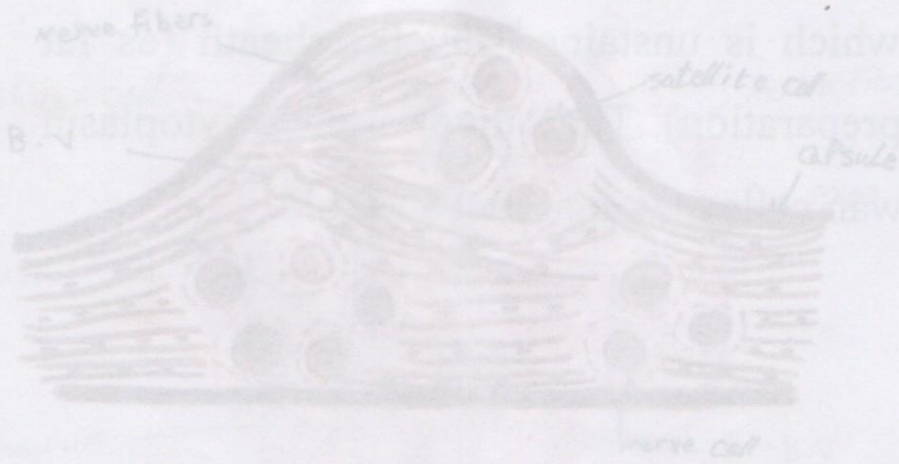
• Bundles of myelinated nerve fibers. Each nerve fiber is surrounded by a connective tissue sheath (endoneurium) and each bundle is surrounded by CT perineurium while the whole nerve trunk is surrounded by CT epineurium.



SPINAL GANGLIA
(silver stain).

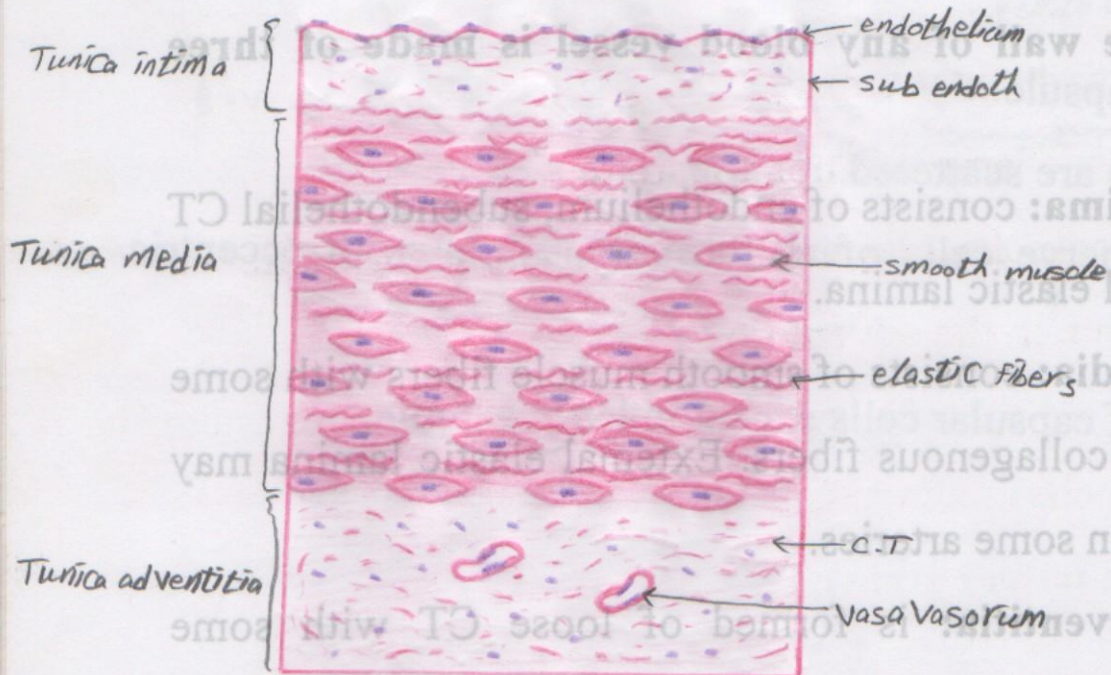


sympathetic ganglia



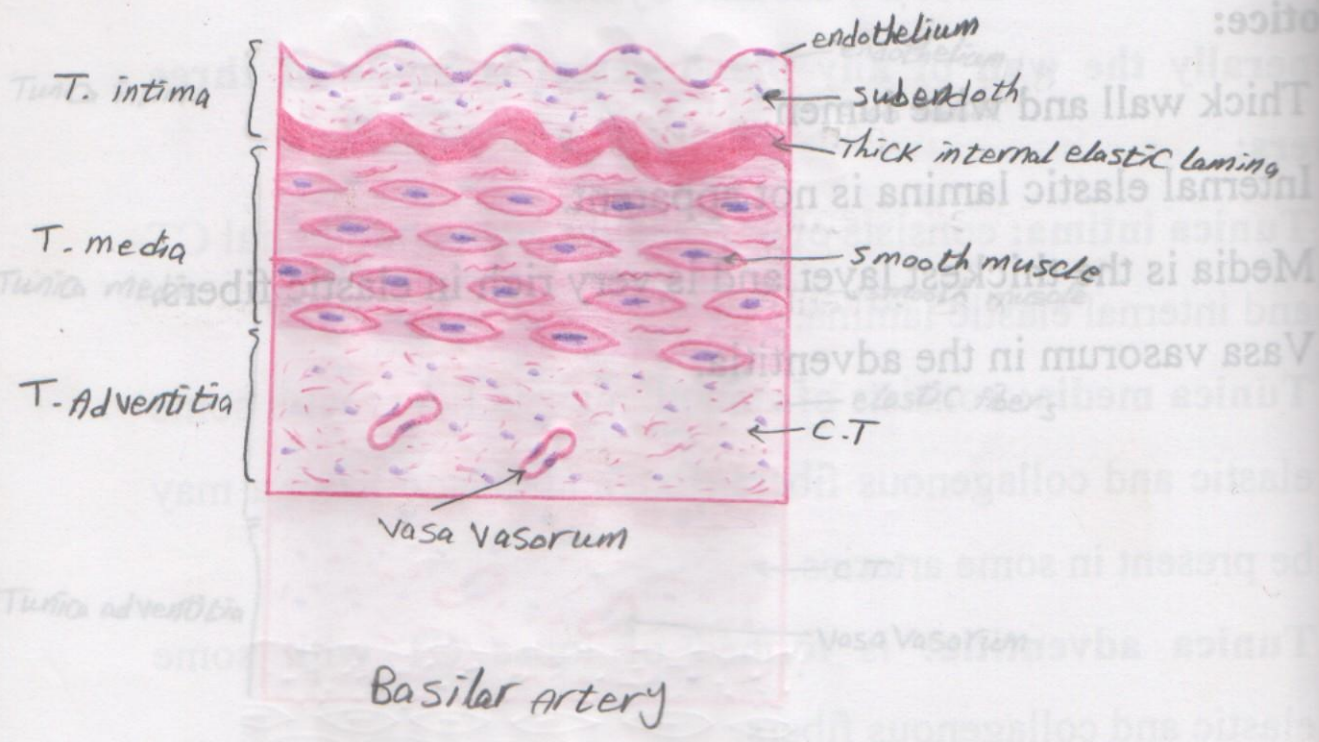
spinal ganglia
(silver stain)

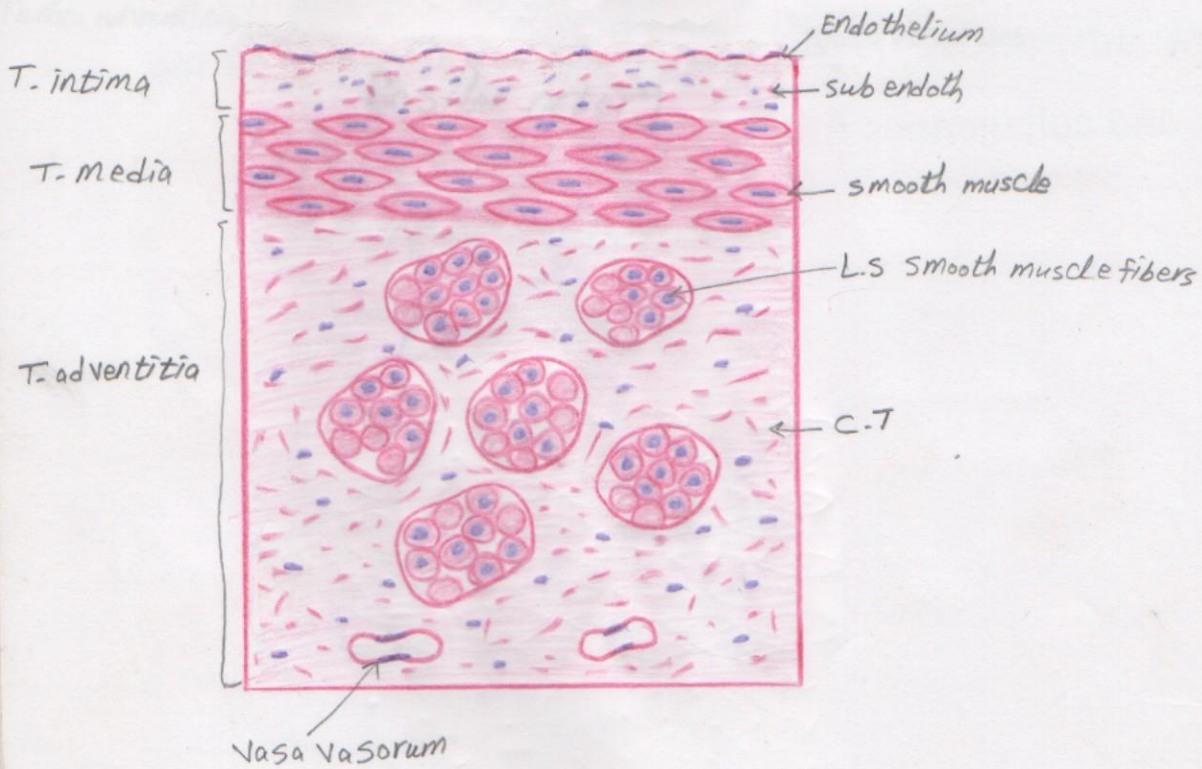
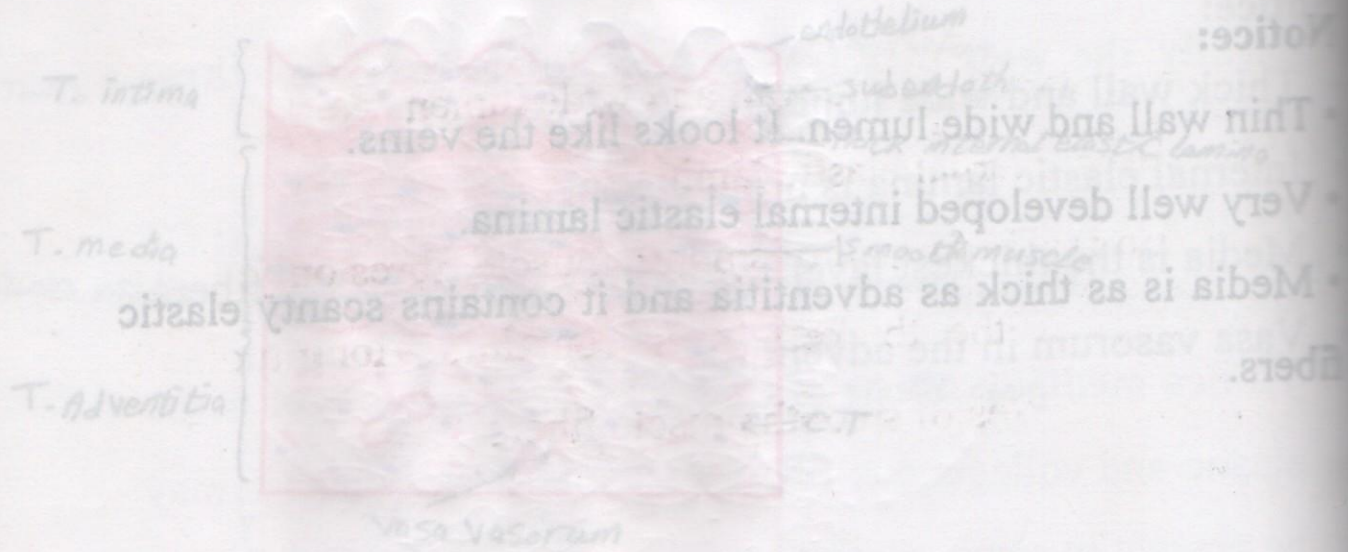
Blood Vascular System



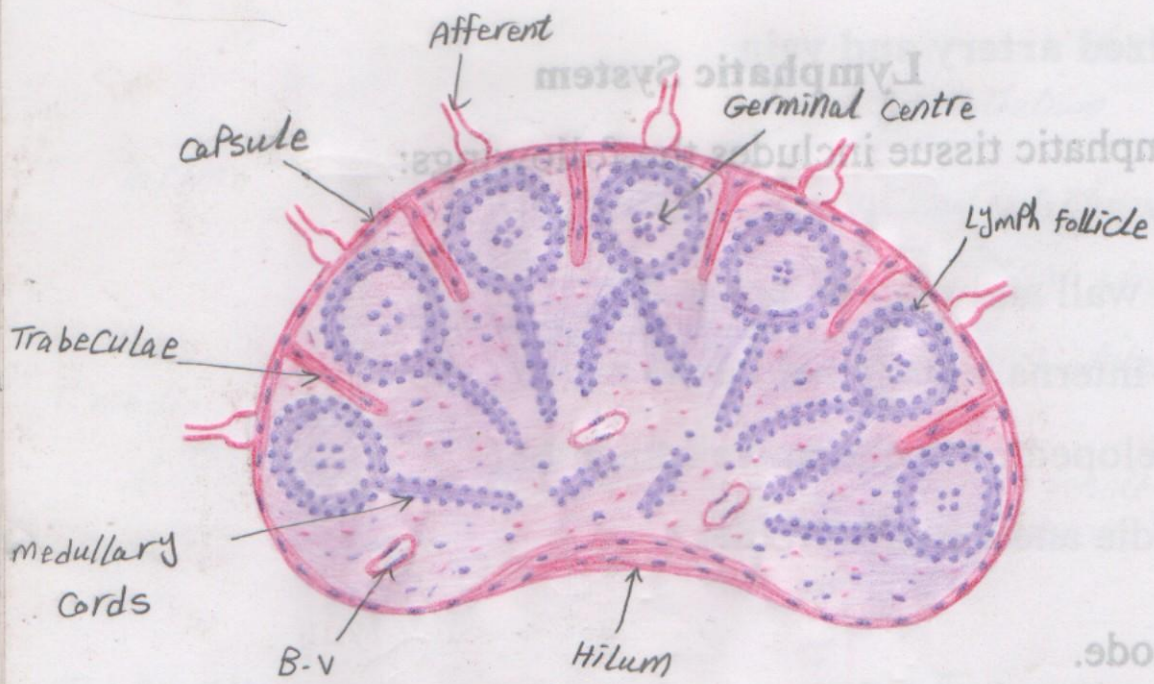
Aorta
(large elastic artery)

Aorta (large elastic artery):

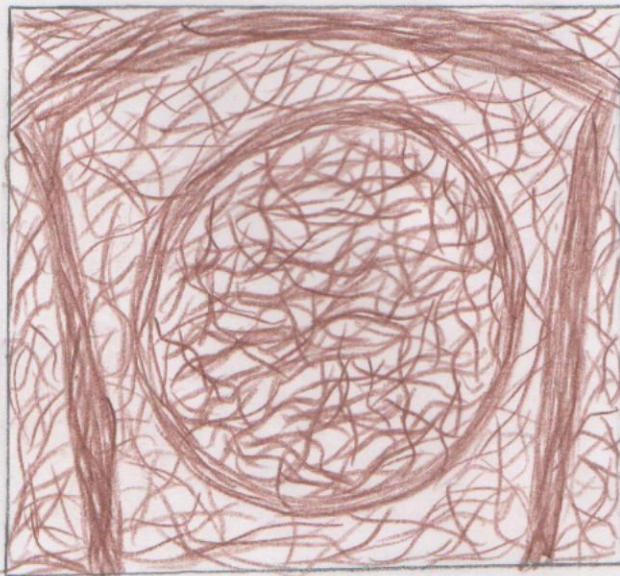




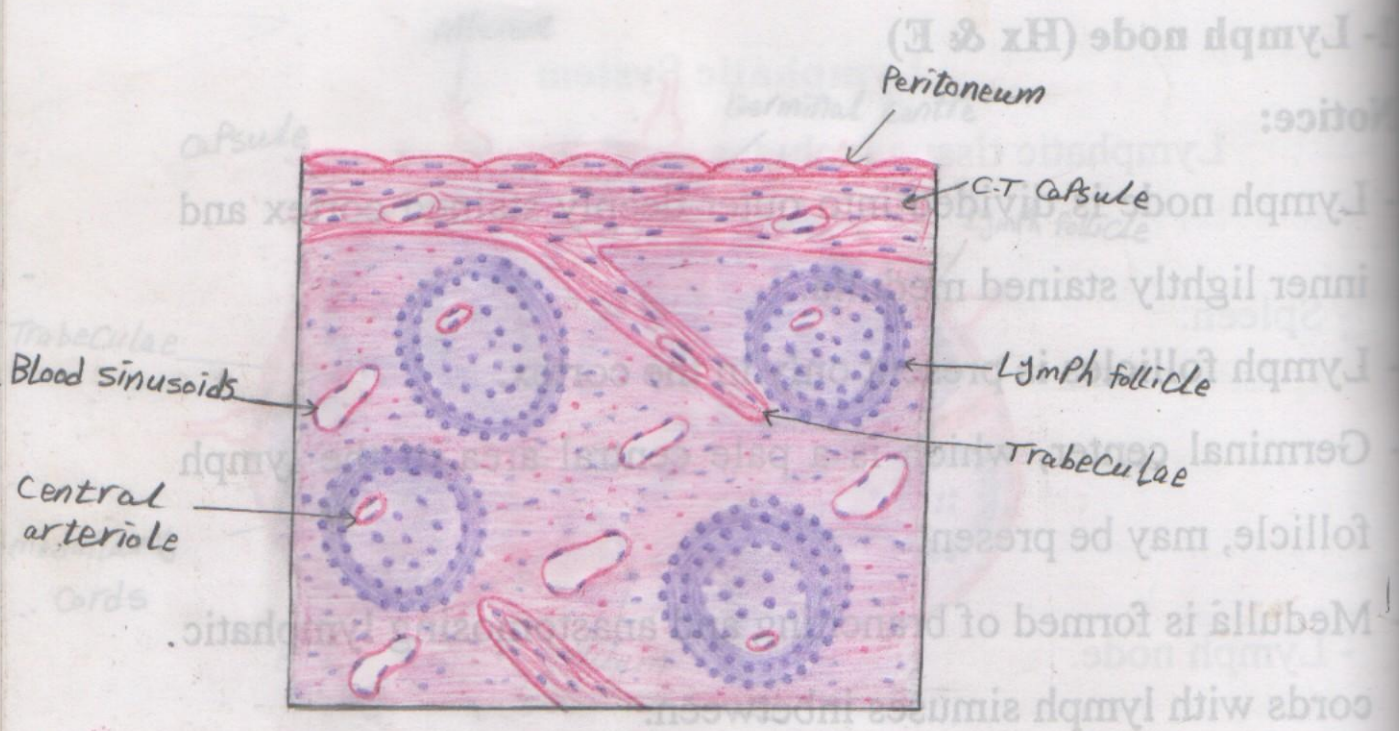
Inferior vena cava
(large vein)



Lymph node (HX-E)



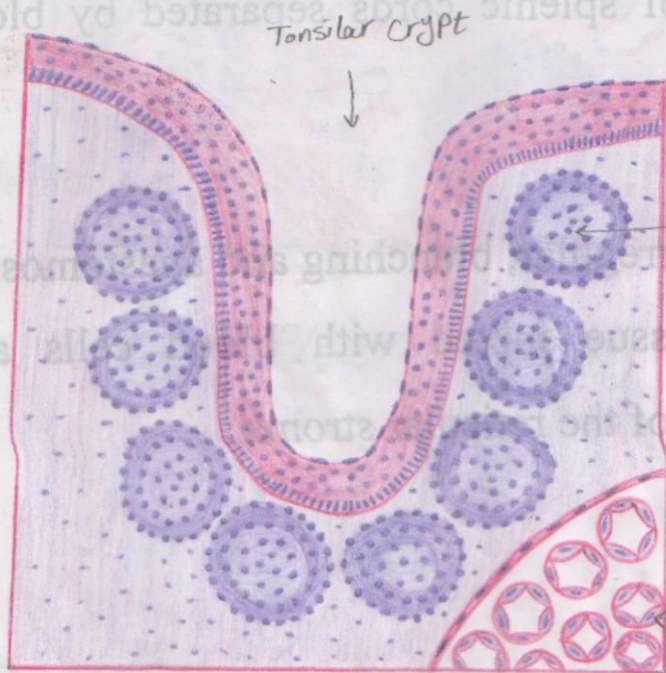
Lymph node (Silver)



Spleen (Hx - E)



Lymph node (silver)



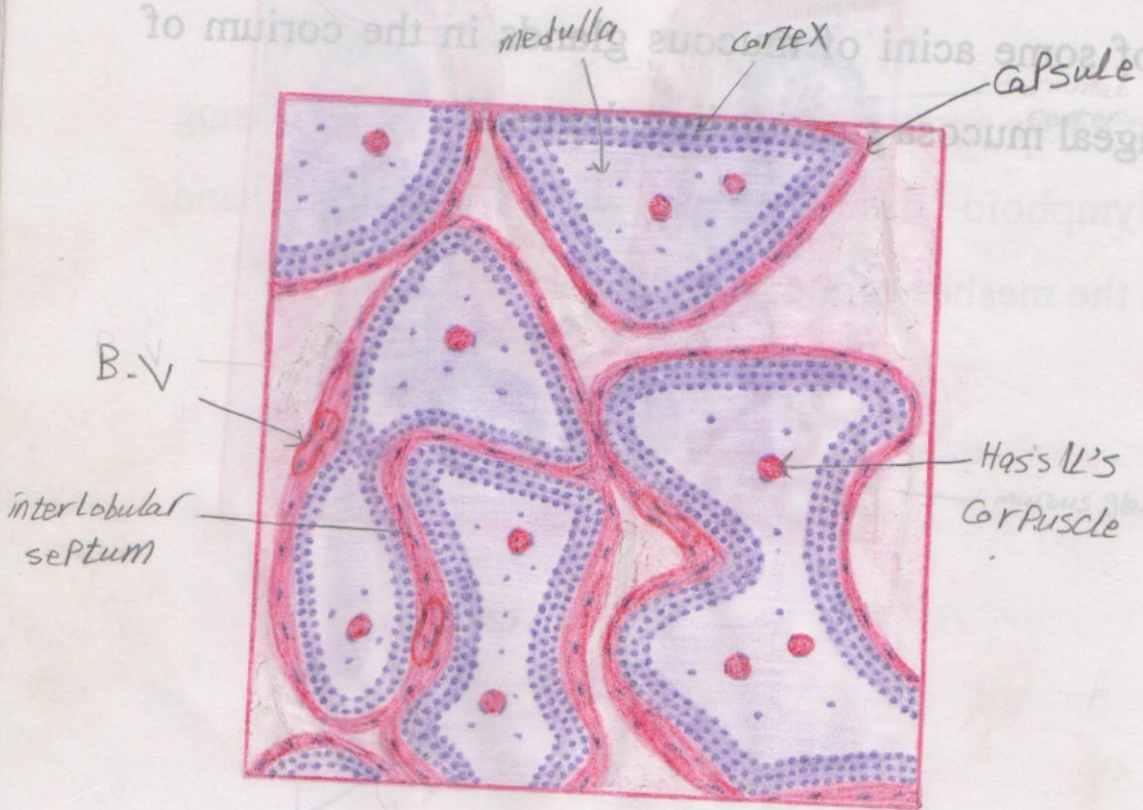
Tonsil



Notice:

- Stratified squamous epithelium cover the tonsils and invaginated to form tonsillar crypts.
 - The lymphatic follicles arranged underneath the epithelium and around the crypt.
 - Presence of diffuse lymphatic tissue in between the nodules.

- Presence of some acini of salivary gland in the corium of the pharyngeal muscles



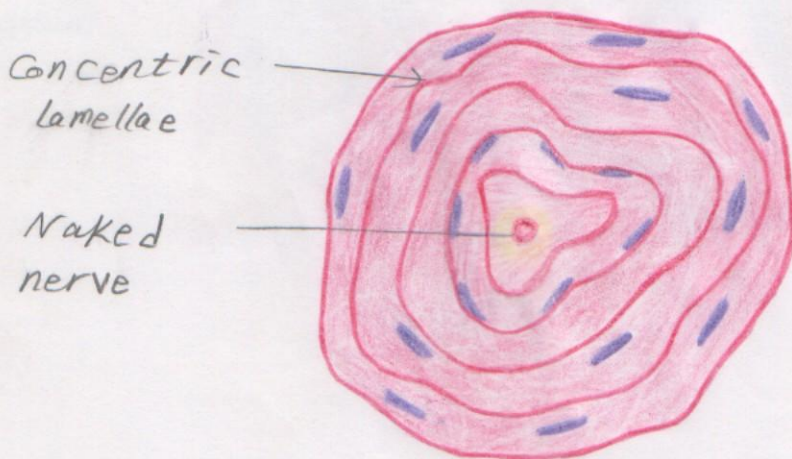
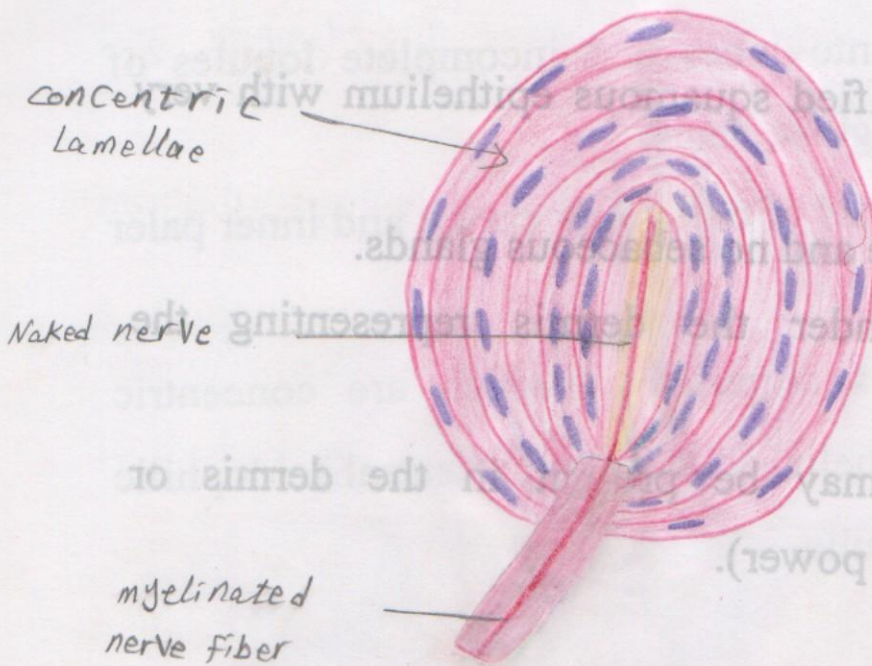
Thymus

✓

Skin

Thick Skin

Notice



(63)

تابعونا وحملتي

جنتي .. انت غايتي

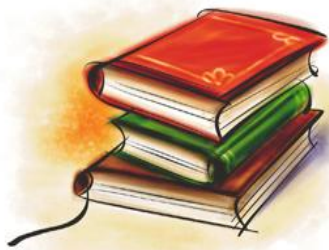
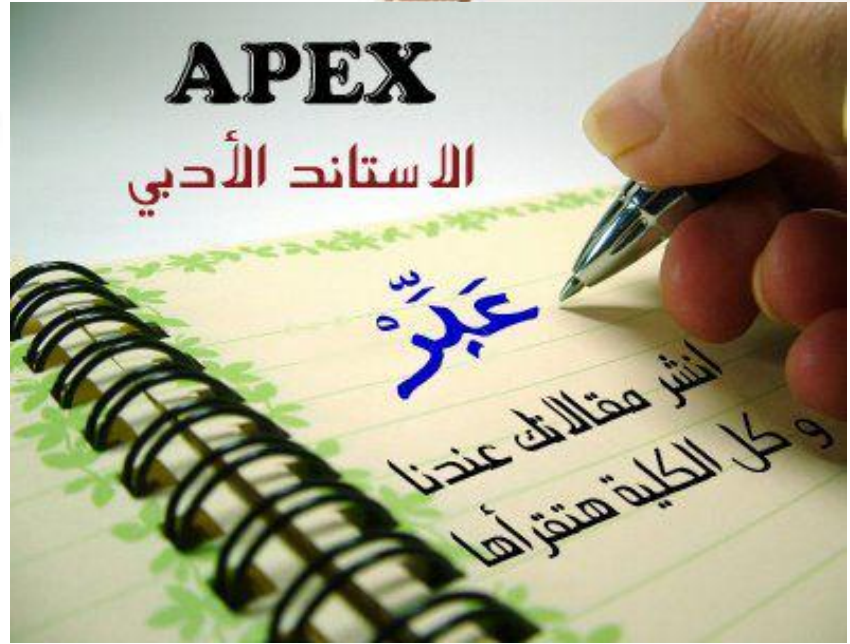
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دوق طعم (التميز)





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شباب طب

APEX Family

أسرة أبكس طب المنوفية